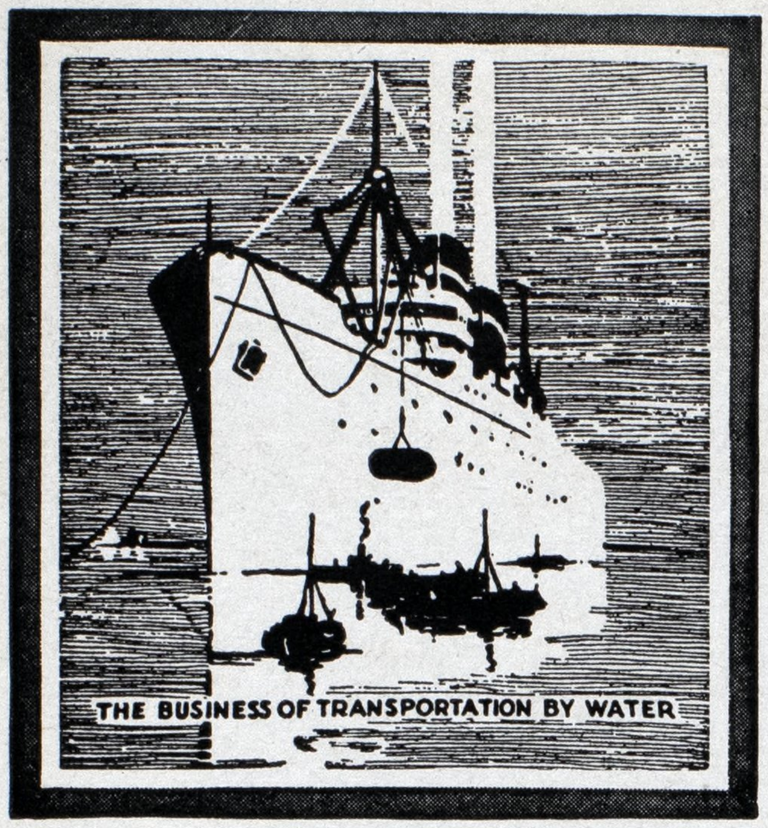
Marine Review

The National Publication Covering the Business of Transportation by Water

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« EDITORIAL »

What Is the Real Objective in Board Ship Sales?

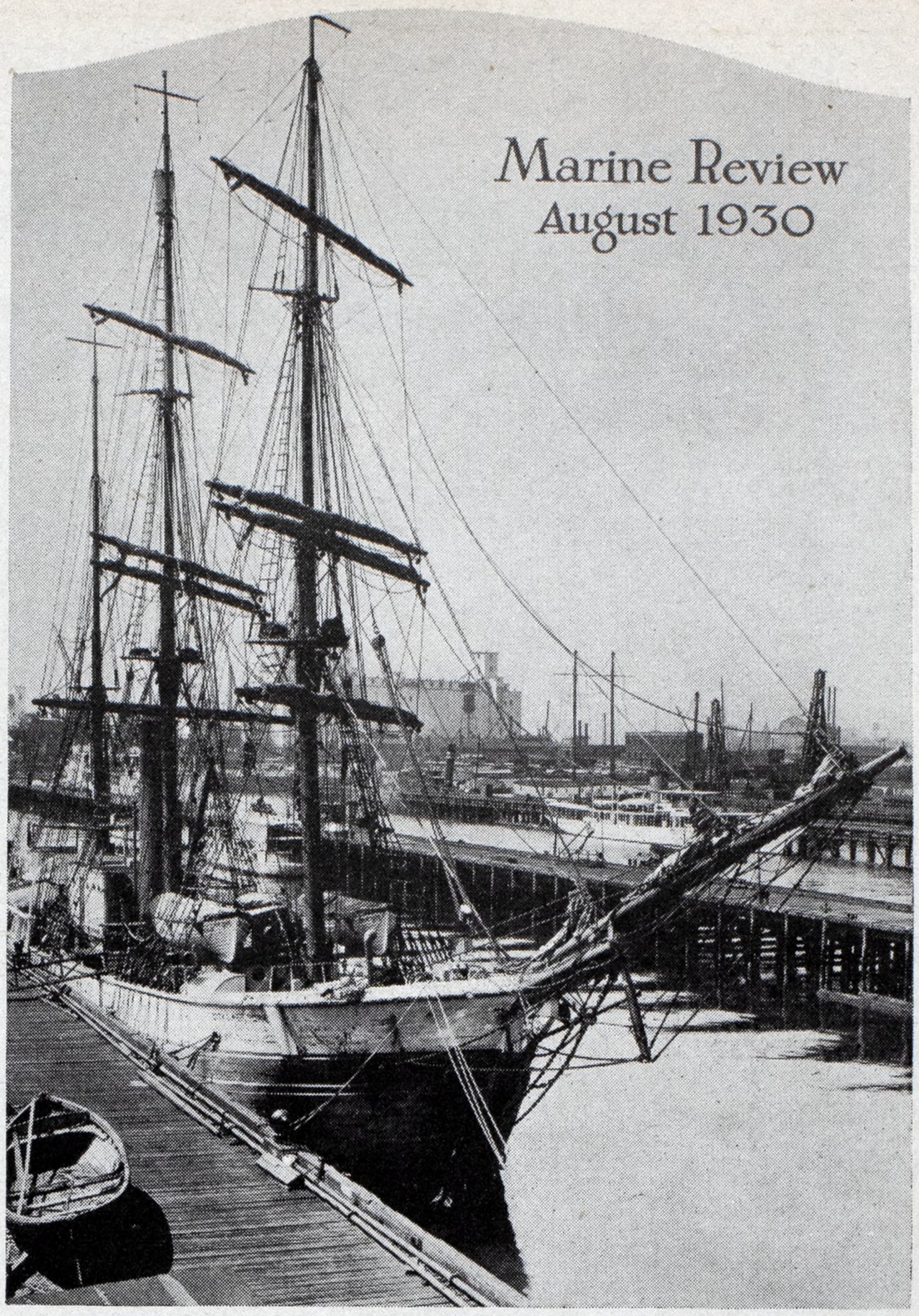
TO BUILD up in the United States as quickly as possible a strong privately owned merchant marine, is the answer that all will agree on. That there should arise sharp differences of opinion as to how this objective may be attained is perfectly natural considering the personal interests involved. The American nation, however, is not interested in the manner of gaining this objective, so that it is fair.

Justice to all parties concerned in the sale of the American-Diamond and the America-France lines will be served best by accepting the findings of the committee appointed by the President. We are in favor of action and deprecate all delays due to governmental inertia and red tape. If a single man in the White House, as head of the government, could have complete personal knowledge of all sides of the question, his individual decision might be made quickly. But since this is impossible and since the sole judgment of any one man may be open to question, the President has adopted the most practical course possible in appointing a group of business leaders of experience in marine affairs to study all phases of the question so that whatever action is recommended it will be fair to the prospective purchasers and for the best interests of the American merchant marine.

The President has a high reputation as a business man and he is above suspicion when it comes to playing politics with government property. We are convinced that the President has taken the right stand.

We Intend to Have a Merchant Marine

PUBLICITY has been given in the marine press of the United States to some very frank and blunt remarks, disparaging the need or the possibility of building up an American merchant marine, made by a Danish shipowner at an international conference held in England recently. Though he may be a thoroughly experienced ship operator this gentleman has very little appreciation of the seriousness with



City of New York, One of the Expedition Ships of Rear Admiral Richard E. Byrd, Returns Safely to Her berth at Tebo Yacht Basin, Brooklyn, N. Y., After Nearly Two Years of Adventurous Service

which the American people is now embarked on the venture to build up its merchant marine in spite of all obstacles. Furthermore, our critic seems to forget that the coastal and gulf states facing two great oceans are in themselves large empires of trade.

We do not feel that there is any question about the ability of the American to compete with the foreign shipowner on somewhere nearly even terms. The amount of annual payment required in mail subsidies and the help given in construction loans for the time being merely tend to offset the differential in operating costs. As sailormen and as ship operators a few years of the sort of training many are now getting will make Americans equal to any other nationals. When the time comes if it is still necessary to make up some definite difference in the expense of operating American and foreign ships, such as the amount of wages and the quality of food, the government will be quite as much justified in continuing mail subsidies or other forms of subventions as it now is in putting a tariff on those goods raised or manufactured here which need protection for the same reason—a higher standard of living.

Twin Screw Diesel Liner Britannic Enters Transatlantic Service

Largest and Latest British Motorship—Choice of Power for Future Large Vessels Is Likely to be Influenced by Her Performance



Long Gallery or Indoor Promenade on the M. S. Britannic

IN THE history of marine engineering as it will be made in the years to come, the completion and entry into service of the motorship BRITANNIC, first White Star liner to be equipped with diesel engines and largest British built motor vessel, may be an event of supreme importance. But since it is impossible to bring to present day judgment the experience of the future, one can only wonder whether after all this type of power is likely to become universally accepted practice for future ships as pretentious as the BRITANNIC and maybe for even larger vessels. At the present time there is the sharpest division of opinion with reference to the application of the diesel engine in such large powers and direct connected to the propellers.

F. E. Rebbeck, manager of Harland & Wolff, builder of the BRITANNIC, at a dinner in Liverpool on June 22 after successful sea trials, said that this vessel had been built for economy and comfort and that the most economical steamer of contemporary design would require about 50 per cent more fuel to drive her. Many factors enter into the choice of power, and the shipowner must approach this problem without prejudice if he is to take full advantage of engineering progress.

The BRITANNIC is the third vessel of her name on the rolls of the White Star line. The first was built in 1874 and the second in 1914. The latter fitted as a hospital ship was lost while in service. The new vessel, of 26,943 gross tons, 680 feet long between perpendiculars, 82 feet in breadth, 43 feet 9 inches in molded depth, is propelled by two propellers, each direct connected to one 10,000-horsepower Harland, Burmeister & Wain, 10-cylinder, double acting, four-stroke cycle diesel engine.

External appearance, equipment and furnishings of passenger accommodations all represent the best in modern design. The lines are graceful with a straight stem, cruiser stern and two low broad funnels. The hull is subdivided into 13 watertight compartments. A continuous double bottom is fitted to carry fresh water, water ballast and oil fuel.

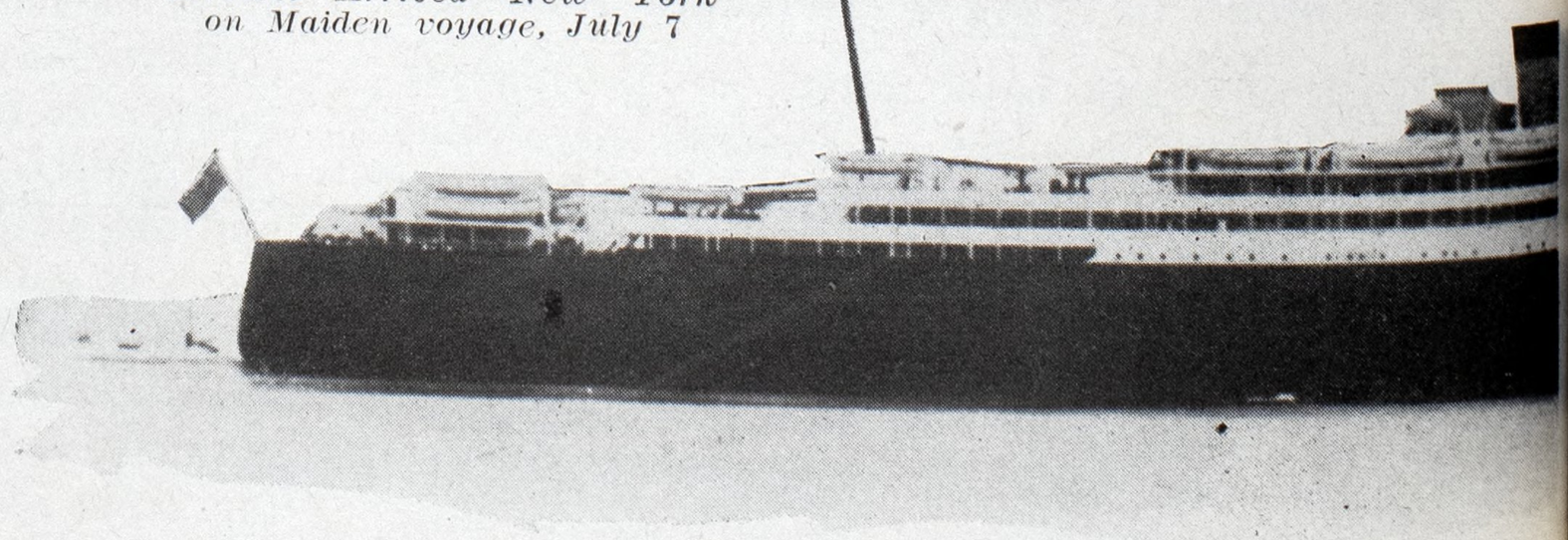
Accommodates 1550 passengers

Accommodations are provided for 1550 passengers, divided equally into three classes, cabin, tourist and third class. In the cabin class 500 passengers are comfortably housed in attractive staterooms resembling the tastefully arranged bedroom of the modern home. There are suites on A deck in varying schemes of color and decoration. Each suite has a lobby connecting the various rooms, a recess for trunks and other baggage, and private bath.

Sea speed of the BRITANNIC is between 16 and 17 knots. She arrived in New York on her maiden voyage from Liverpool on July 7, having sailed from Liverpool on June 28.

P. A. S. Franklin, president of the International Mercantile Marine Co., manager in the United States for the White Star line, said at the dinner on board of the BRITANNIC on the evening of the day she arrived in New York that he had talked with the officers of the BRITANNIC and with several of the passengers; that all were unanimous in saying that the ship on her maiden voyage was satisfactory in every particular. Mr. Franklin concluded that from what had been said by those who had traveled on the vessel and what he knew of the ship himself, that he was sure that the BRITANNIC is a notable addition to the White Star line. Those who were guests of the White Star line on the trial trip, June 19-22 remarked on the comfortable cabins, the pleasant general rooms and saloon, the fine

M. S. Britannic — White Star Line — Britain's largest and newest Motorship. Twin screw, 27,000 gross tons. Cabin liner for the New York-Liverpool service. Arrived New York on Maiden voyage, July 7



deck accommodations and the swimming pool provided for those traveling outside the cabin class. It was the general opinion that the first class can compare with that of any of the bigger ships sailing from Southampton and continental ports.

The BRITANNIC supersedes the ADRIATIC in the distinction of being the largest liner entering the Mersey. She will sail regularly out of Liverpool for New York. On board during the trial voyage representing the White Star line were A. B. Cauty, general manager and W. R. Roberts, director of the line and manager at Liverpool. We have no actual operating figures on the fuel consumption while at sea or in port. In a technical description of the vessel given out by the owner it is stated that she will consume 80 tons of fuel oil at sea per day.

During the trials of the BRITANNIC, wireless telephone communication was maintained between the ship and the offices of the builder, Harland & Wolff at Belfast. While the ship was at sea during both preliminary and official trials on the firth of Clyde and the Irish sea, a constant communication was maintained between ship and shore by wireless telephone. This service was of definite value to the builder and is likely to be used in future trial trips.

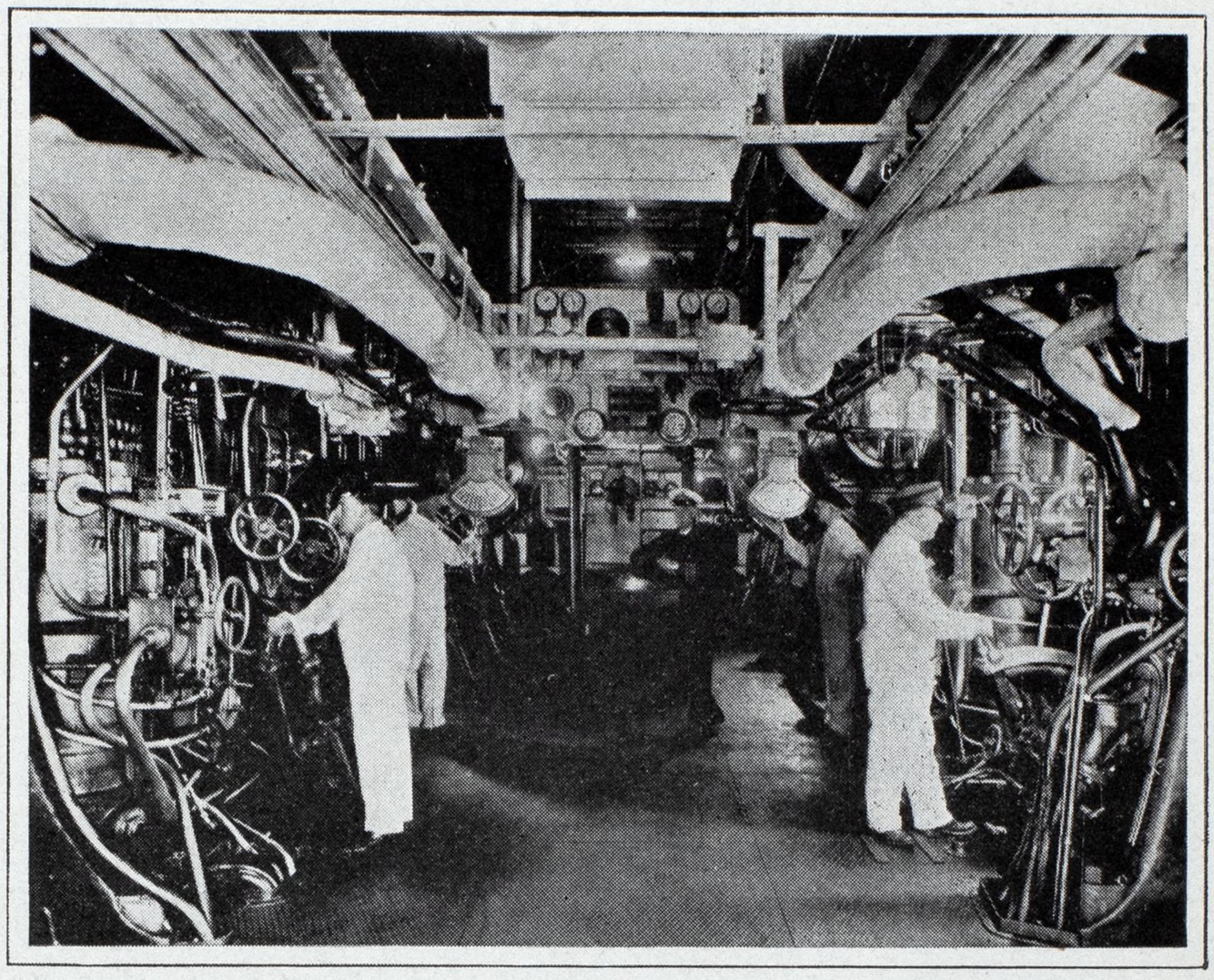
Public Rooms Seem Spacious

Public rooms have the appearance of unusual spaciousness. The dining saloon, in Louis XIV style, is for the greater part two decks high. The lighting which is in the center part of the room is mainly concealed, flooding the whole of the upper part with a soft glow and adding to the apparent height. The furniture is in walnut and the floor is arranged in a quiet design. The walls of the saloon as a whole are finished to represent the masonry for which the French are famous, with enough color to produce a rich effect. The embarkation entrance is finished in harmony with the saloon, the atmospheric sky painting being a feature. Lighting is by means of amber bowls on the walls.

Entrance on B deck is the center of the business side of passenger life. Here are grouped offices of the purser, chief steward, information, mail baggage master, and wireless. A fireplace and recesses for settees and chairs complete the arrangement in this vicinity.

The principal public rooms are located on the promenade deck, beginning with a picturesque card room at the forward end in the French style of late Gothic. Immediately aft of the card room is the forward staircase and entrance which is in lighter tones of old ivory, old gold and mahogany with a marbled floor design. Then comes the lounge which is decorated in late eighteenth century English style made interesting with modern pier glasses and a variety of furnishings. There is a large central dome in this room making it possible to show moving pictures. Dancing is provided for in the center of the lounge on a resilient parquet floor, and around the walls in a series of alcoves are groups of chairs and settees.

Leading from the lounge to the smoking room there is a long gallery forming a promenade protected from the weather. It is decorated in the style of William and Mary and general color scheme of grays and blues with walnut and lacquer furniture making a room of pleasing and unusual proportions with large bay windows at either end. Fine rugs and pictures add an air of comfort and luxury. The after staircase opens from the long gallery; and retired from the general public rooms is the drawing room in a color scheme in white and green in old Colonial style with furniture in keeping, such as a reproduction of a Martha Washington mahogany armchair. There is a marble fireplace and a bright steel grate. Adjacent to the drawing room and next to the after entrance is a new feature; a ladies' retiring room with toilet rooms attached. Beyond is the children's playroom, the walls carrying reproductions of fairy tales. The furniture and fittings are on a reduced scale.

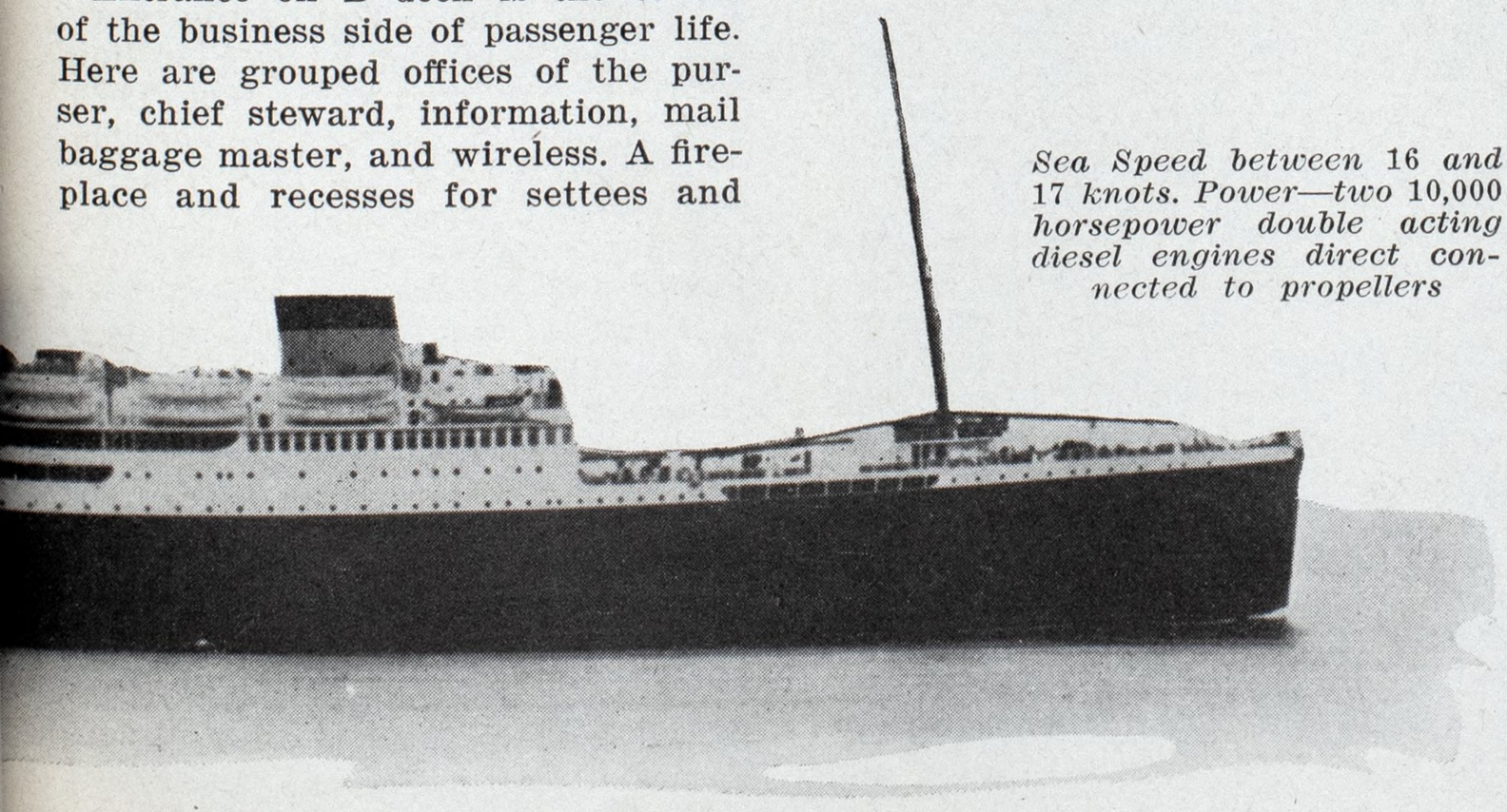


Starting Platform Between the Main Engines—M. S. Britannic

Taste and Luxury in Decorations

The smoking room resembles a Tudor room in an Elizabethan mansion. Oak linen fold panelling, heavy hewn beams, deeply cut characteristic carving of armorial bearings rich in color, needlework curtains done by hand, and modern luxury in furniture, all tend to give a sense of comfort and good taste. The veranda cafe at the after end of the promenade deck is in old English black and white work and is fitted with sliding doors.

A large swimming bath is arranged with ample space for spectators. The pool is lit by floodlights shining direct from the ceiling, while the ceiling is lit in turn by bowl fittings on the pillars. The gymnasium is decorated in modern style with the walls painted in apricot color gradually lightening in effect at the cornice. A coved ceiling



Sea Speed between 16 and 17 knots. Power—two 10,000 horsepower double acting diesel engines direct connected to propellers

springs from the back of this cornice enabling the concealed light to be reflected evenly over the room. Window frames, floors and the gymnastic appliances are painted a rich blue with curtains in orange offering a marked contrast. Alleyways to the passenger accommodations are unique in that they are arranged in bays divided by pilasters and finished in a pleasing color scheme.

A number of suite rooms are arranged on A deck in a variety of color schemes and decorations. A sitting room, for instance, has panelled walls painted in egg shell blue relieved with white moldings and modelling, walnut furniture, old gold curtains and upholstering with pearl finished electric fittings. An adjoining bedroom has old fashioned patterned wallpaper and the woodwork is painted in old parchment color with the wall light shades in old parchment. Furniture is in mahogany and the curtains and upholstering are in rose in tone with the walls. Each suite has a lobby connecting the various rooms with a recess for the innovation trunk. The private bathroom is paneled in colors and fully equipped in the modern manner. There are a number of other suites and single cabins finished in a variety of styles and color schemes. Private bathrooms on A deck are specially decorated and completely equipped, the bathrooms for the suites being finished in sea green and primrose. All staterooms, whether cabin, tourist or third class have hot and cold fresh water. The cabin baths have hot and cold showers.

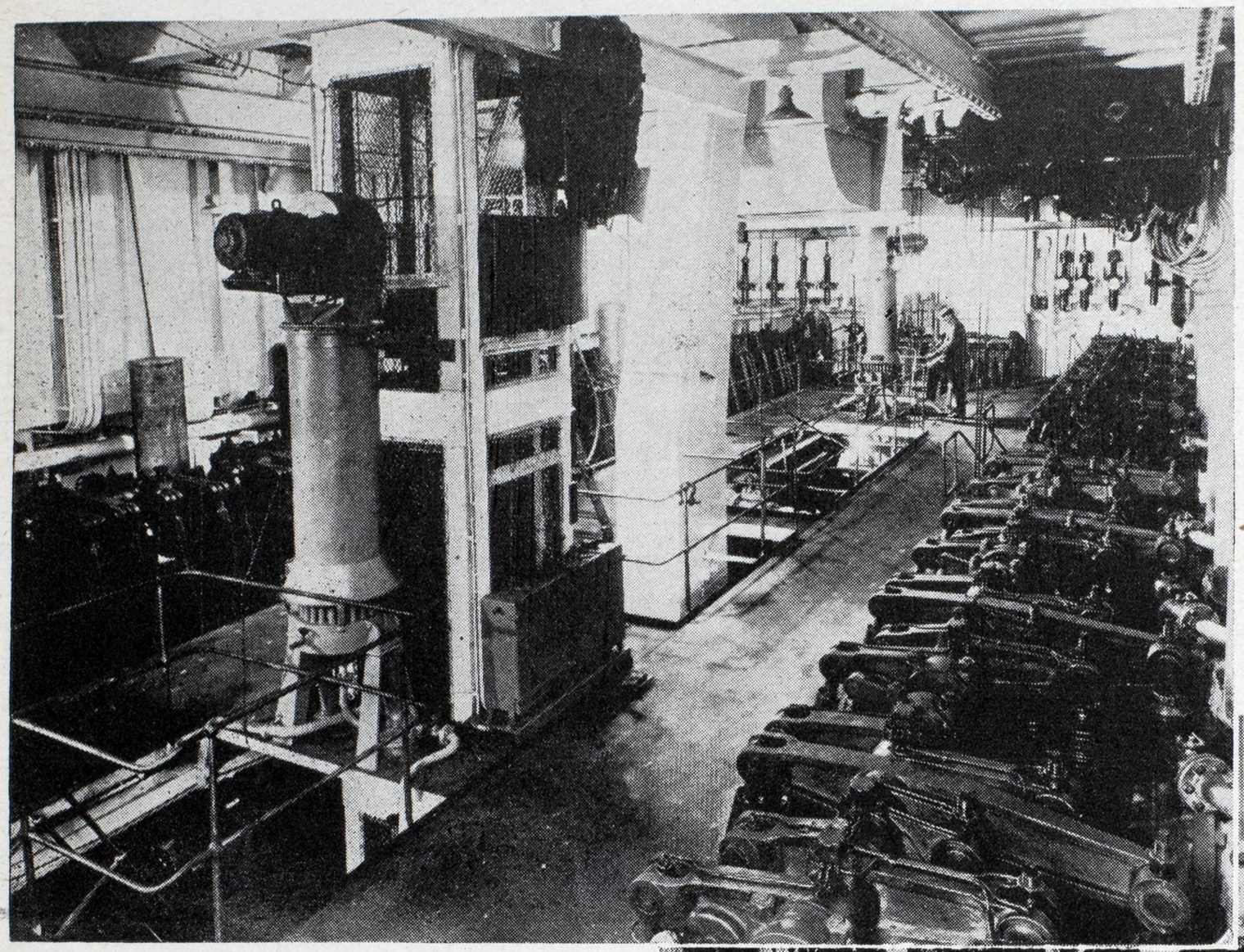
Tourist and third class public rooms and entrances have received unusual attention to make them exceptionally comfortable and attractive. The smoking room for the tourist class is on the lines of the old English farmhouse of the sixteenth century, in half timber and rough plaster, with old tiled floor, antique furniture and casement windows with leaded glass. Adding to the general effect are reproductions of old masters and old wrought iron lantern brackets and ceiling fittings in the same style. The ladies' lounge in the tourist class is painted a sunshine color and is furnished and decorated as a sitting room with a large bay window and a comfortable window seat. A deeply recessed fireplace on the starboard side and comfortable easy chairs and Chesterfield settees complete the scheme. A fully equipped children's playroom is also an attractive feature in this class.

An interchangeable tourist or third class smoking room is decorated in oak and old plaster, casement windows, old settles and a beam ceiling. The doors are built of planks and are hung on wrought iron hinges. The tourist class lounge is in modern style with walls panelled in polished hard wood, with furniture in keeping. The same applies to the tourist or third class lounge on B deck forward. Lounge on C deck for tourist or third class is a pleasant room with amber colored electric light fittings on the ceiling and with a ruboleum floor. It is furnished with easy chairs and settees.

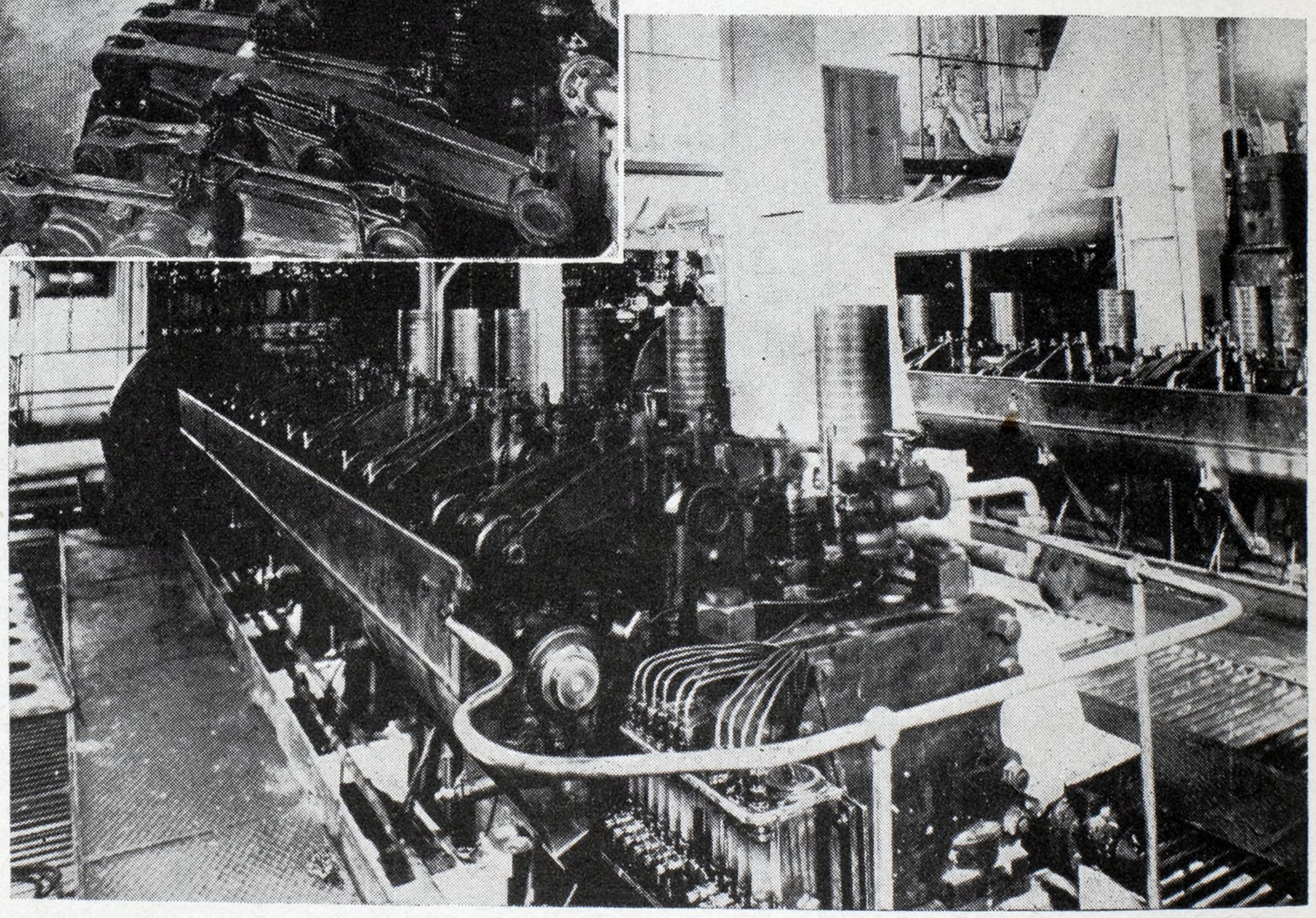
Other public rooms in the third class include a smoking room in old oak and plaster with rough hewn timbers on the walls, oak panelling, and beam ceiling. The furniture is in old style with long upholstered oak settles. The third class ladies' room is designed as a simple drawing room with wall panelling painted a soft green color. Pictures on the walls and curtains and upholstering carry out the scheme in a quiet and modest way. The third class children's playroom has concealed electric lighting and the walls are decorated with subjects from nursery rhymes. A Wendy hut carries out the playroom idea with quaint windows and picturesque roof. It is furnished suitably as a children's room.

A commodious dining saloon for the tourist class is designed in a simple and dignified style with walls painted in warm shades of deep amber relieved with touches of other color. Buffets with mirrors over are arranged on the center line of the forward end while the walls are fitted with frame mirrors. The floor is of marble patterned ruboleum with an attractive finish, giving an extremely durable and noise deadening surface.

The third class dining saloon is designed with an ivory frieze above a general wall panelling of warm brown



M. S. Britannic Engine Room—Top Platform—Main Engine Tops and Lifting Gear for Handling Valves and Engine Parts



Auxiliary Engine Room, M. S. Britannic—Cylinder Tops of Generator Sets

with pilasters in a darker shade. Dark brown mahogany sideboards give a note of richness to the room set off by an ivory ceiling and the floor of ruboleum in dignified design.

Diesel Propelling Machinery

Two separate engine rooms are provided, in one of which is located the main diesel propelling machinery and its auxiliaries and in the other the diesel generating sets and other auxiliaries. Two diesel engines of Harland, Burmeister & Wain make of 10-cylinder, double acting, four-stroke cycle type, developing 10,000 brake horsepower each at 110 revolutions per minute, are directly connected to two propellers. Cylinders are cooled by fresh water and the pistons are oil cooled. The cylinders are 840 millimeters (33.1 inches) in diameter by 1500 millimeters (59.4 inches) stroke. Injection air for the main engines is provided by independently driven air compressors and for this purpose there are four air compressors each driven by a Harland, Burmeister & Wain make, four-cylinder, trunk piston, diesel engine. These air compressors are located in the auxiliary engine room and also supply air for maneuvering purposes, to four separate tanks. In the forward engine room are four 500-kilowatt generators driven by diesel engines of the same make and of the six-cylinder trunk piston type. In case of breakdown one small, steam driven emergency compressor supplies the starting air.

In accordance with modern practice use is made of the heat of the diesel engine exhaust. The exhaust from the two main engines generates steam at sea in four Clarkson thimble tube type boilers. The heating circumference of each boiler is 500 square feet and the boiler is 5 feet 3 inches in diameter and about 11 feet in height over all. Each boiler can produce at least 2500 pounds of steam per hour at a working pressure of 100 pounds per square inch. At maximum capacity the boilers are capable of recovering about all of the available heat in the exhaust gases. The boilers are not fitted with oil burners, but do have feed water regulators, and require no special supervision when the ship is under way. Still another Clarkson boiler takes the heat from the exhaust gases of the two diesel engine generators. This boiler has a heating surface of 250 square feet and can generate 1900 pounds of steam per hour with a working pressure of 100 pounds per square inch.

Besides the five waste heat boilers mentioned above there are two single ended, oil fired scotch boilers for additional steam, particularly for use in port.

No pains have been spared to make the BRITANNIC a safe and strong vessel. She was built under survey of



Cabin Lounge on M. S. Britannic

Lloyd's and of the board of trade and meets every requirement of these two bodies for her class. Equipment includes the Gyro compass, submarine signalling apparatus, direction finding gear and motor lifeboats equipped with wireless. There are twenty sets of Welin quadrant type of davits with electric boat control for each set. The steering gear is of the electric hydraulic type, with pumps and motors in duplicate and under full control from the captain's bridge.

Cargo carrying arrangements are most complete. Four large cargo holds are served by eight large hatchways provided with 16 electric winches and derricks capable of taking loads up to 10 tons. Twelve of the winches are of three-ton capacity and four of five-ton capacity. They are of the latest worm geared type with contactor controls, built in England, as of course, was practically everything that went into the vessel. The windlass and capstan gear also operated electrically, is of the vertical type. There are two wildcats for working 330 fathoms of 3 7/16-inch studlink chain cables, and two



Cabin Dining Saloon on M. S. Britannic

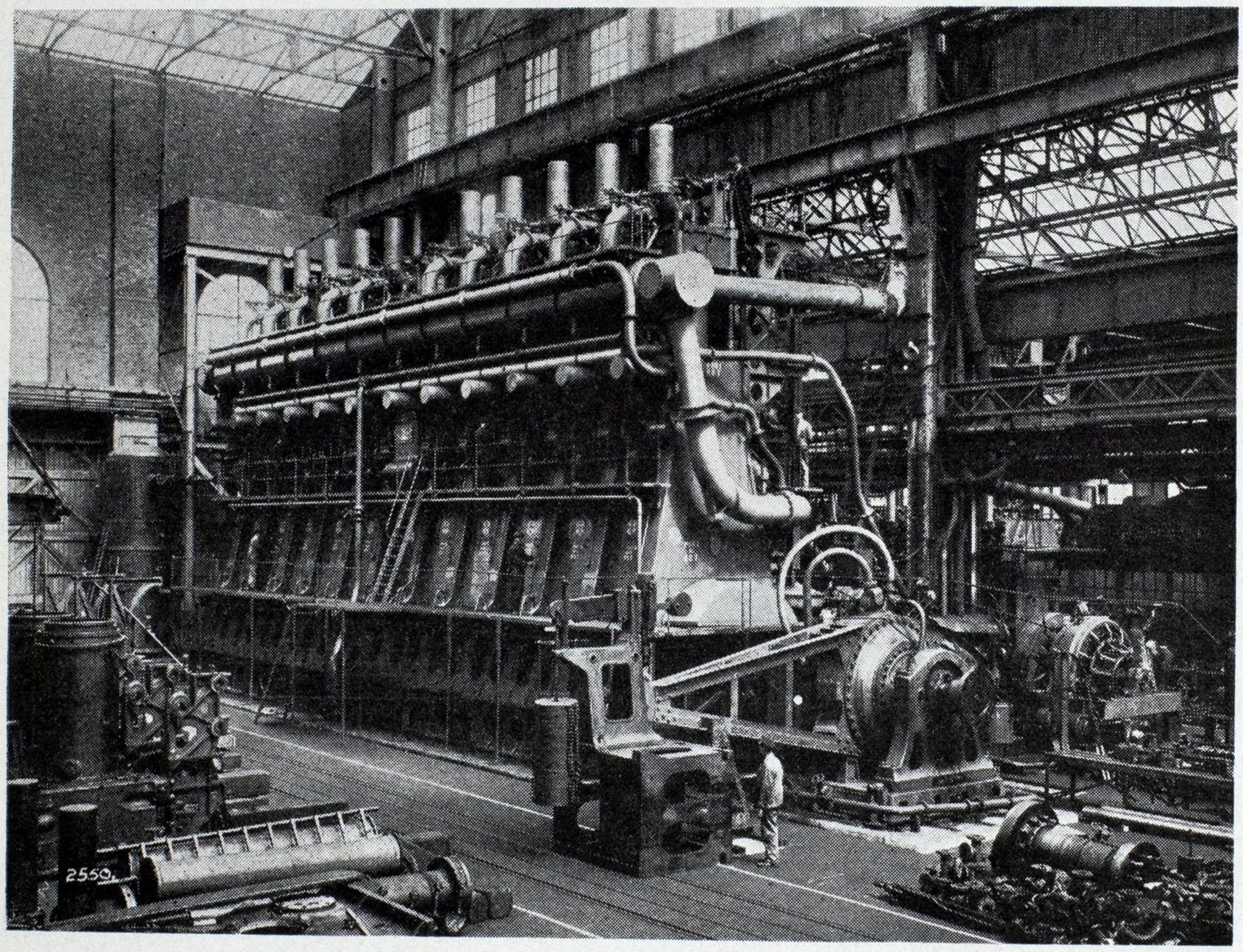
warping capstans. This windlass is driven from the deck below by two 170 brake horsepower electric motors by means of spur, worm and bevel gear. Full load pull on each wildcat is 60 tons at 20 feet per minute and at each capstan, 20 tons at 60 feet per minute. Slack rope speed is 250 feet per minute. Under ordinary conditions the port set is independent of the starboard set, but it is also so arranged that the port motor can drive the starboard wildcat and warping capstan, or the other way around.

Elaborate Refrigerating System

A CO_2 and brine system of refrigeration is installed. There are two horizontal twin compressors, each direct connected to an electric motor. The usual condensers, evaporators and electrically driven brine and water pumps are provided. Cargo and provision chambers fitted for carrying fruit, fish, meat, etc. are insulated with granulated cork held in place by wood sheathing. Chambers are cooled partly by brine circulation through grids placed on the roofs and walls and partly by cold air circulation, by fans and batteries. An ice making tank is provided with rocking gear driven by an electric motor. And there are also a number of wine coolers and water coolers fitted in connection with the bars and pantries. These coolers are operated by independent compressors, thus avoiding brine pipes through the accommodations. The total insulated capacity in cargo spaces is about 85,000 cubic feet and the ship's provision chambers are of ample capacity. The plant is located on the lower deck at the forward end of the auxiliary engine room and each twin compressor CO_2 machine is driven by a 75 brake horsepower motor.

In addition to the electrical generating sets mentioned above there is an emergency diesel driven generator of 75 kilowatts capacity situated above the margin line for supplying lighting and power for essential services should the main sets be out of action. Cooking is done by electricity, not only for the main ranges but for grills, roasters, fish friers, salamanders, griddle plates and hot presses. The baker's oven and the oven in the confectioner's shop are also electrically operated.

Ventilation is provided by some 79 electrically driven pressure fans, ranging in size from 10 inches to 55 inches in diameter. Over 40 of these fans are fitted with heating elements, so that the vessel can be kept comfortably warm in the coldest weather.



Port Main Engine of M. S. Britannic on Test Bed

These air heating fan units are supplemented by electrical heaters distributed throughout the accommodations.

Electric Driven Deck Machinery

Deck machinery includes 38 silent, electrically driven winches, steering gear, four large capstans and two large warping winches . A number of service motors drive such apparatus as dough mixers, potato peelers, dishwashers, elevators, store hoist, pantry hoist and silver cleaning machine.

As the Britannic was one of the first new ships to come under the regulations of the international radiotelegraph convention at Washington, 1927, her wireless installation is of the best modern type. The Marconi wireless installation is in a room directly aft of the chart room and includes a valve transmitter and receiver, an emergency transmitter and a Marconi direction finder. Two motor lifeboats are also fitted with wireless. The main transmitter is an installation for continuous and interrupted continuous wave signalling on a 600 meter and 800 meter. For continuous waves only, the wave lengths are between 1887 and 2725 meters. The aerial is 335 feet in length with a horizontal span of 265 feet long and 144 feet above the water line. A two valve receiver, a new development in marine work covers the entire commercial wave band from 15 meters to 20,000 meters.

Two electrical depth sounding machines are installed. All engine room auxiliaries, more than 60, are electrically operated by motors varying from 100 horsepower to 2½ horsepower.

The bell has been eliminated from the call bell system and there is substituted outside of each stateroom one red and one green electric light, operated by similarly colored buttons in the stateroom. An elaborate system has been installed for repeating the band and phonograph music throughout passengers accommodations in all classes. Lighting throughout the ship is on an elaborate scale, there being an equivalent of over 7000 thirty-watt lamps installed.

Main engine fuel oil is purified by a battery of seven Sharples No. 6 size centrifuges of totally enclosed type. Each machine is driven by a 2½ horsepower electric motor and has a capacity of 300 gallons per hour. Lubricating oil is treated by four No. 6 size Sharples centrifuges of the open type. These are located in the main engine room. There are two similar machines in the auxiliary engine room.

For communication there are electric engine room telegraphs and an extensive system of telephones between the bridge and the engine room; also connections with the engineers' quarters and a direct line between the captain and chief engineer. Lines are also installed to the purser's office and in the steward's department.

Reorganize Plant

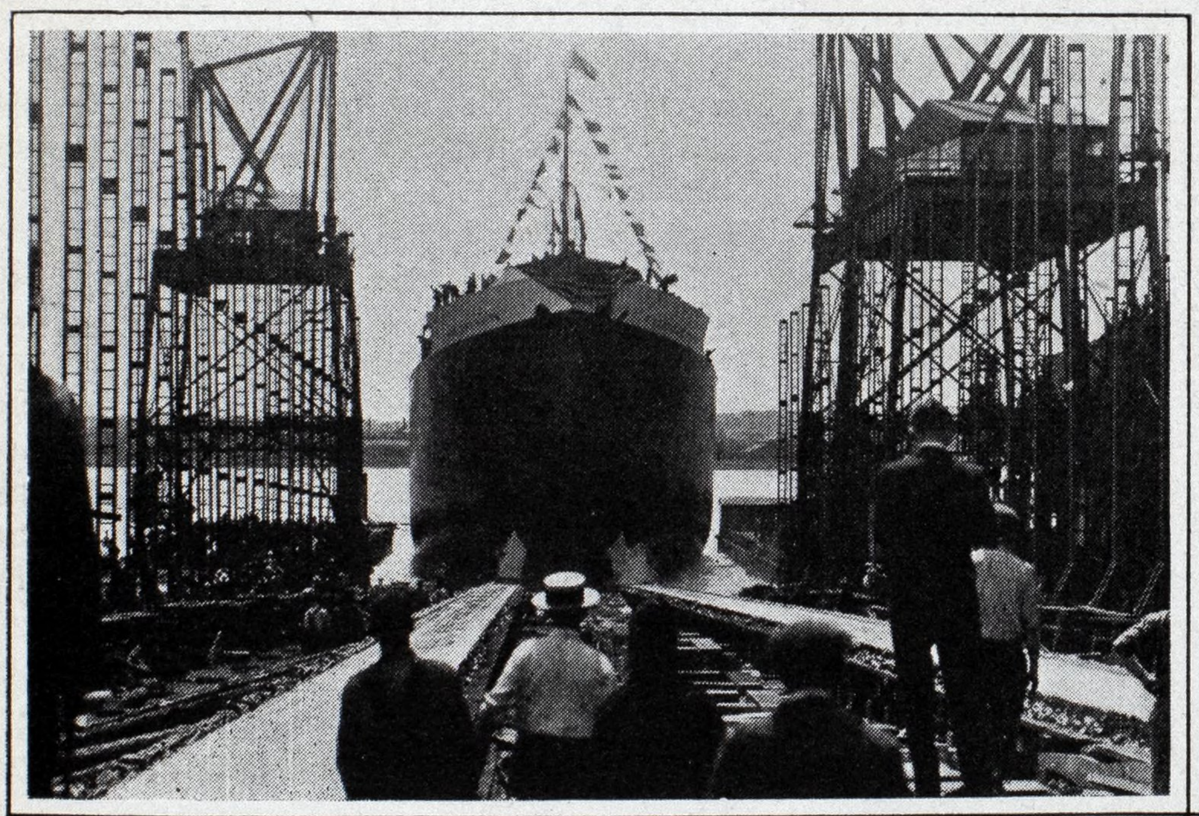
Expansion of facilities of the Charles Cory Corp., producer of marine and industrial equipment, was announced recently by A. P. Homer, vice-president. The home factory and general offices in New York are being made over, new offices have been opened in Chicago and Quincy, Mass., and the Philadelphia branch has been reorganized. In Philadelphia, R. L. Reaves has been appointed marine sales manager, and W. B. Fletcher has been made industrial sales manager. L. E. Oneal and C. L. Homer, respectively, are in charge at Chicago and Quincy. The Cory corporation was purchased recently by the Bendix Aviation Corporation.

Modern Steam Turbine Plant in New American Tanker

THE Standard Shipping Co.'s (subsidiary of Standard Oil Co. of New Jersey) new bulk oil tanker G. HARRISON SMITH, was launched July 12 at the Kearny yard of the Federal Shipbuilding & Dry Dock Co. Mrs. G. Harrison Smith acted as sponsor before a large gathering of officials and friends.

This latest addition to the Standard Shipping Co.'s fleet is one of the most modern bulk oil carriers afloat, being built on the Isherwood bracketless system of longitudinal framing, while the application of high steam pressures and temperatures to her machinery is in accordance with the most progressive developments in marine propulsion.

Her dimensions are: 543 feet overall in length, 74 feet beam and 40 feet 6 inches in depth 'tween deck height main to shelter deck 14 feet 8 inches. Her deadweight capacity is 18,000 tons on a 28 feet 6 inches draft and speed on trial is to be 11 knots. Capacity of main cargo oil tanks is about 706,000 cubic feet; capacity of summer tanks about 159,000 cubic feet.



Single Screw Turbine Reduction Geared Tanker G. Harrison Smith Launched at Federal Shipbuilding & Dry-Dock Co., Kearny, N. J., July 12, 1930

The hull is divided by 17 oiltight and watertight transverse bulkheads. There are 11 bulk oil tanks, pump room, fuel oil tank, forward hold and machinnery space. The forward hold is arranged for carrying ballast and the 'tween decks forward is arranged for carrying stores or miscellaneous freight.

A centerline bulkhead is fitted in the oil tanks extending from the keel to the shelter deck and expansion trunk bulkheads, one port and one starboard, extending from main to shelter deck. Wing spaces outside the expansion trunk bulkheads are divided into five compartments on each side, fitted up as summer tanks. The fuel oil tanks have a capacity of about 1300 tons.

Forward there is a raised forecastle containing carpenter shop, lamp room, paint room and store room. A bridge house is constructed amidship with steel bulkheads at each end. Quarters for officers, etc. will be provided in a steel house on the bridge deck. Above this house will be accommodations for the captain, radio operator, etc. The wheel house will be equipped for the sperry gyro compass and automatic steerer.

Quarters for the engineers, officers, petty officers and remainder of crew, galley and mess rooms are provided for in a steel deck house in 'tween decks aft.

The propelling machinery is located aft and consists of a De Laval steam turbine unit, driving a single screw. The main unit is of the cross compound type and is composed of one high pressure turbine and one low pressure turbine, in series, connected through flexible couplings to double reduction gears. The slow speed gear shaft is directly coupled to the line shafting. The astern turbine is arranged in the exhaust end of the low pressure ahead turbine.

The normal rated capacity of the main unit is 4000 shaft horsepower at a propeller speed of 75 revolutions per minute although the unit will develop a maximum of 4400 shaft horsepower at 77½ revolutions per minute. The low pressure turbine is designed to exhaust through the bottom of the casing into the condenser, arranged athwartship underneath.

There are two Babcock & Wilcox oil fired water tube boilers, designed to deliver steam at 400 pounds gage pressure, at a temperature of 750 degrees fahrenheit. Air heaters and a balanced draft system are provided. Each boiler is provided with four oil burners of the Todd mechanical atomizing type.

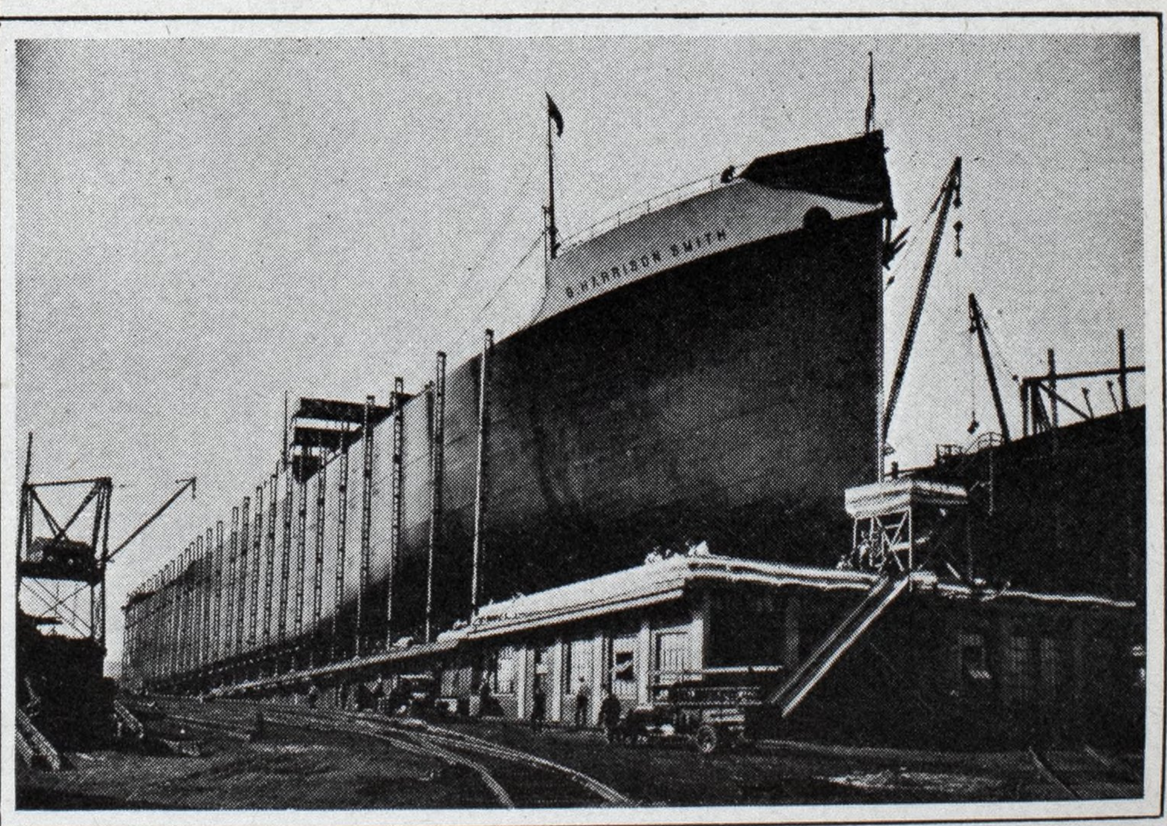
A centenary celebration was held on July 4, 5 and 6 at St. Johnsbury, Vt., by Fairbanks, Morse & Co. to commemorate the first 100 years of building Fairbanks scales.

Annual Life Boat Race

The fourth annual world's championship life boat race will be held in New York on Labor day. It is thought that practically the same rules as last year will govern the coming race, with the exception of the question of greasing the bottom of the boats.

Up to the present time the Norwegians have shown a marked supremacy in this sport. The steamer SUD AMERICANO'S life boat crew won in 1927, a crew from the Maureatania in 1928 and in the last race the SUD AMERICANO repeated their victory allowing them two legs on the Todd trophy which at the present time is held by the agents of the line, Garcia & Diaz. If a boat from this line is victorious this year, Garcia & Diaz will be the permanent owners of the Todd trophy.

This race attracts large crowds each year and has grown to be an outstanding sporting event in the marine world.



Ready for launching. Length overall, 543 feet; beam, 74 feet; depth, 40 feet 6 inches; draft, 28 feet, 6 inches; deadweight capacity 18,000 tons. Speed on trial 11 knots

New Diesel Electric Lightships Are More Economical

By Ralph C. Smith

SIX new lightships, of a type embodying a number of improvements over vessels previously used for the guidance of mariners, have been under construction for the lighthouse service, of the department of commerce, for some months, and all are expected to be placed in commission before the end of summer. Three of these were being built by the Albina Marine Iron Works, Portland, Ore., and the other three by the Charleston Dry Dock & Machine Co., Charleston, S. C.

Moored on exposed stations where they must remain regardless of weather conditions, and containing an ever increasing amount of special equipment, lightships have presented a number of difficult problems. Efficient operation of these vessels, to and from station, requires means of propulsion, but such power is used only at infrequent intervals. To meet these conditions lighthouse service engineers have turned to electric propulsions with diesel engine generating sets as a solution especially well suited for the requirements for this duty.

With diesel electric installations the new ships are able to get under weigh in less than five minutes. This can be accomplished with steam only by having a continuous pressure on the boilers at all times. This is a distinct advantage, not only in the saving of fuel but in assuring the safety of the ship should the moorings part in a storm.

A report from the Pacific coast, where Blunts reef lightship, California, the first of this class to be placed in service, recently weathered a 90-mile gale, indicates that the new vessels are not only efficient from a mechanical point of view, but are also excellent sea boats, capable of withstanding the peculiar conditions to which they are exposed.

No Change in Appearance

The diesel electric lightships are all-steel vessels, but retain in general the outward appearances of previous lightships, familiar to mariners. Even the stack remains, being utilized for the individual exhaust pipes of the four diesel engines and for the oil burning donkey boiler used for heating the vessel. The rigging is of schooner type, there being two masts, each surmounted by lightnouse service standard lanterns.

The single screw is driven by an electric motor developing about 250 shaft horsepower, 50 horsepower less than was usually necessary in the older types of steam lightships. The use of an electric propulsion motor in place of the usual steam engine is particular important in this service as electric motors deteriorate less and require less attention than steam engines when idle for long periods of time. The electric equipment, as installed on these vessels, weighs less than steam equipment when consideration is given to the necessary auxiliaries and water that has to be carried with the latter.

The fact that a lightship may be moored on a station for months at a time, with no necessity for using the main engines, placed the steam engine at a disadvantage, for power was available quickly only if steam were kept on the boilers constantly. In place of this type of plant, the new lightships are equipped with four diesel engine generating sets. These sets when coupled together electrically, drive the propulsion motor, and when the vessel is on station are used separately for generating current for the fog signal, anchor windlass, and any other auxiliary machinery. This arrangement eliminates two auxiliary generating sets, formerly used for driving the auxiliary machinery, and causes each set to be operated without extreme periods of idleness. The alternate operation of each of the four diesel engines for auxiliary purposes, and the turning over of the main motor at slow speed for short periods each day, keep all pieces of equipment in good working order.

Power Cost Cut in Half

Not only is the cost of producing power with diesel engines less than one-half that of the former oil burning steam plants, but the fuel oil requirements of the new lightships are sufficiently less to make possible a reduction in displacement of about 100 tons. This has permitted a reduction in the horsepower of the main plant, and produced a vessel of finer lines offering less resistance to her moorings.

The diesel electric generating sets are in units of 75 kilowatts, one of which is ample to operate the air or electrically operated fog signals, furnish power for the radiobeacon, hoist the anchor, handle small boats, and other ordinary work about the vessel, with additional power available when needed for any other purpose. Two small auxiliary generating sets are provided for lighting the vessel over night and in fair weather, and for pumping up the air bottles for the diesel engines, should this become necessary.

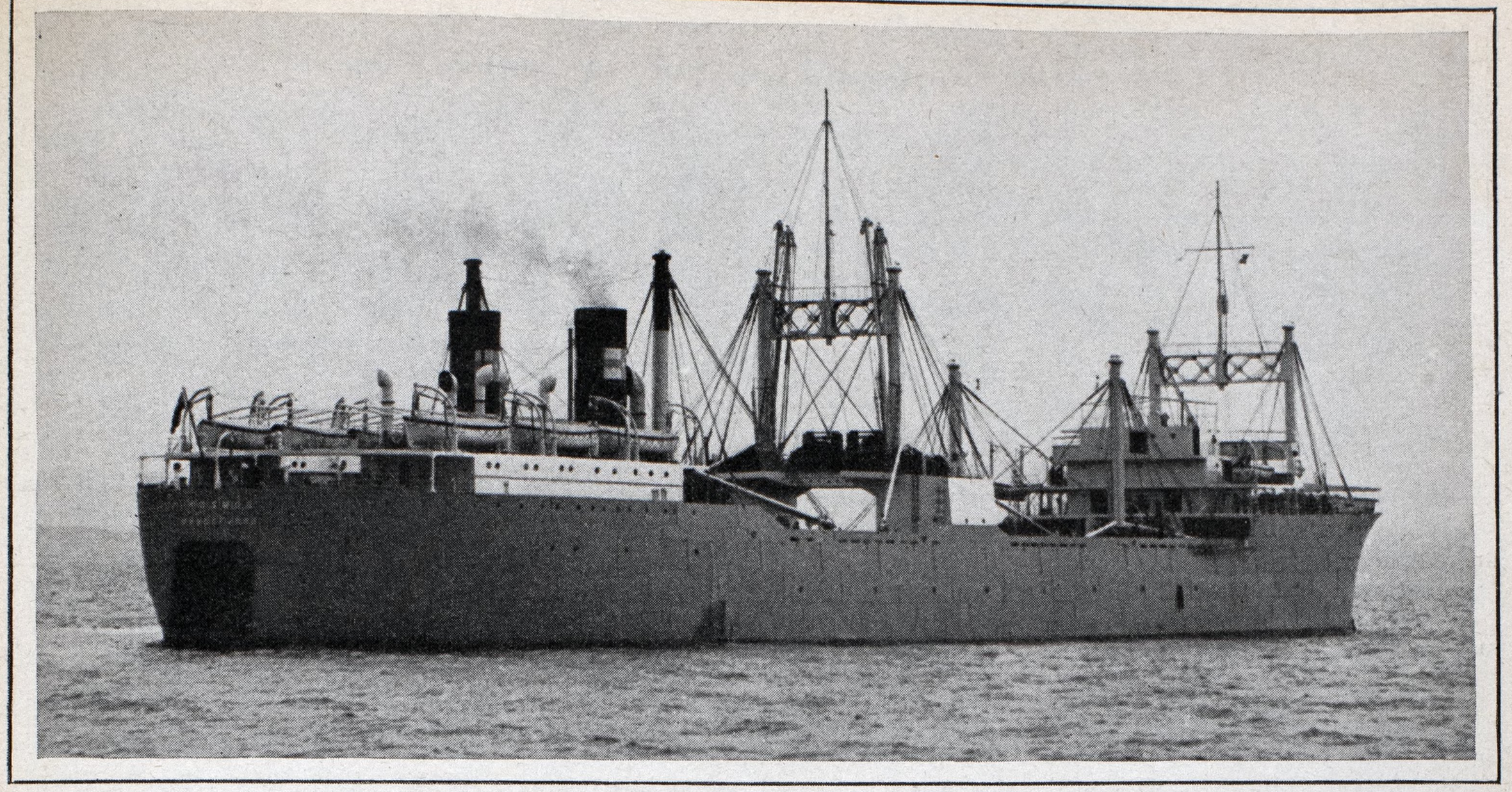
Two types of fog signals, operated by compressed air and electricity, are available. Three vessels have been equipped with diaphones, a very efficient type of signal which is air operated. The three other vessels have a new type of electrically oprated signal in which alternating current is applied direct, and the sound is emitted by a vibrating diaphragm. A fog signal operated oth-

(*Continued on Page* 58)

The author, Ralph C. Smith, is attached to the Lighthouse Service, Department of Commerce. This article was prepared exclusively for MARINE REVIEW.



New Diesel Electric Lightship for Blunts Reef, Cal.



Kosmos—Largest Whaling Factory Vessel in the World—Built by Workman Clark, Ltd., Belfast—Displacement—32,000 Tons—Norwegian Owner to Use in Antarctic—Carries Scouting Airplane

European Shipping Continues Dull

Quarterly Survey Shows Little Change—Prosperity Not Yet in Sight—Giant Cunarder Has Been Ordered

By Frank C. Bowen

THE second quarter of the year has been little more cheerful for European shipping and shipbuilding than the first three months, and it is only the more optimistic who can see the break in the clouds which foretells a return to shipping prosperity. In spite of this, however, a number of interesting events are connected with the period under review, particularly with regard to the North Atlantic trade.

Most important of all is the fact that the new giant Cunard record-breaker has at last been ordered, the contract going to John Brown & Co., Ltd., of Clydebank. This yard had prepared the plans, and, moreover, it has a long and satisfactory connection with the Cunard company. As far as the Northeast coast is concerned, disappointment in failing to get the order is likely soon to be satisfied, for there is every possibility of a second ship of the type being laid down in the not too distant future, in which case the contract will inevitably go to Swan, Hunter and Wigham Richardson, Ltd., of Newcastle-on-Tyne, who built the eminently satisfactory MAURETANIA nearly a quarter of a century ago.

Then the EMPRESS OF BRITAIN has been launched for the Canadian Pacific line, far and away the biggest and fastest ship that has yet been considered for the St. Lawrence route. She will have a gross tonnage of about 46,000 and a speed of 25 or 26 knots, so that she will not only be able to satisfy all the reasonable requirements of the Canadian trade, but will also be in a position to attempt, at least, to capture a proportion of the traffic which now goes through New York. She is, without doubt, a wonderful ship from every point of view.

Progress is being made on the REX for the Navigazione Italiana and the CONTE DI SAVOIA for the Lloyd Sabaudo, while definite arrangements now have been concluded to lay down a record-breaker for the Compagnie Generale Transatlantique, of France, within the next few months. One cannot help wondering where the passengers for all these luxury liners can come from. The first-class eastward bookings for this year are very distinctly down, and so much new luxury tonnage is being put on service that it is a little difficult to see how it can be satisfied.

On the other hand, the cabin-class bookings maintain a most satisfactory level, even if it is at the expense of the first class. For this service the White Star and Compagnie Generale Transatlantique have each commissioned a remarkably fine motor-ship, the BRITANNIC under the British flag and the LAFAYETTE under the French. In each case arrangements are being made for the construction of a sister ship.

The LAFAYETTE has a gross tonnage of 25,032 and a speed of 18 knots, while the BRITANNIC is 26,943 tons and manages about 17 knots. The BRITANNIC is described in detail on pages 20-24. In each case the cabin-class is infinitely superior to the first-class of only a few years ago, and it is only natural that they should bite very deeply into the former first-class trade.

On the continent the most interesting new tonnage, apart from the LAFAYETTE, comes from Holland, where the internal combustion engine now has firmly established itself in favor for the main passenger and mail services to the East Indies. The BALOEREN, of 16,982 tons, and the JOHAN VAN OLDENBARNEVELT, of 19,040 tons, are the latest ships to be added to these services, and in size, speed and luxury they are infinitely

Trend of Trade and Shipping in British Isles

	March	April	May	Five months ended May 31 1930	Five months ended May 31 1929
Total entrances of cargo ships into British ports:	4,583	4,557	5,364	22,691	21,537
Number of vessels	4,843,557	4,979,240	5,787,819	24,685,439	23,697,990
Tonnage	818,919	1,012,190	1,225,971	4,484,024	4,750,366
Tonnage from Atlantic coast of North America	(16.9%)	(20.0%)	(21.25%)	(18.3%)	(20.0%)
Total clearances from British ports:	5,008	4,783	5,381	25,238	25,459
Number of vessels	5,341,126	5,258,674	5,980,703	27,329,820	27,066,776
Tonnage	721,557	939,629	1,124,726	4,024,970	4,115,873
Tonnage going to Atlantic coast of North America	(13.6%)	(17.9%)	(18.9%)	(14.7%)	(15.2%)
Total value of goods:	£61,606,160	£54,705,519	£60,087,593	£303,406,487	£359,794,741
Exported	£93,420,482	£83,922,401	£91,037,363	£458,327,789	£513,399,068
Imported					
Exports of coal:	4,783,444	4,422,799	5,056,048	24,491,358	23,210,341
Tons	£3,983,119	£3,698,737	£4,204,323	£20,655,222	£18,500,401
Value	1,233,959	1,214,388	1,412,291	6,476,981	6,679,257
Tonnage shipped for use of steamers					

finer than anything that the Dutch have attempted off the Atlantic.

At the same time developments may be expected at any time in consequence of the final settlement of the differences which have existed for seventy or eighty years between the Hamburg American line and the North German Lloyd, a settlement which involves a 50-year agreement to pool interests and to avoid unnecessary competition, while each company fully maintains its own individuality. The importance of this arrangement is increased by the huge sum which they are drawing in compensation from the United States government, and European shipping companies which run in competition with them are frankly apprehensive as to what move they are likely to make.

Interested in the Oriental Service

Both companies are very keenly interested in the Oriental service, which at the moment is being maintained by tonnage inferior to that employed at the outbreak of war. It is there that the first attack is expected, and the P. and O. company is getting ahead of it by ordering five new 15,000-ton 18-knot passenger liners for the service to China and Japan, setting an entirely new standard on that route. Before the war 9000-ton ships were designed for the Eastern service, and even they were regarded as being unduly luxurious by many people. The latest Japanese addition to the Eastern route, a motor-ship of 11,800 tons, now is on her maiden voyage to London.

Beyond orders for very special tonnage, such as fast transatlantic and other liners, the British yards have obtained very little business lately, and most of the continental ones are not very much better off. Shipbuilders again are paying attention to the possibility of getting contracts from the Soviet government, which finds that many of the ships that it ordered from its own shipyards now are two years overdue, and it would be very willing to place the orders abroad if sufficiently long credit could be arranged.

In France, shipbuilding matters are particularly bad, some shipowning firms which possess their own yards preferring to place their contracts with Britain. There is a plea for the restoration of the subsidy system of 1881, and the admittedly desperate plight of shipping today is being put against the very disappointing results obtained by thirty odd years' experience with the direct subsidies. The Italian yards also are hit by the completion of the subsidized mail fleet and now are agitating for state aid for cargo steamers as well as liners and packets, although it is a very open question if this will be granted.

The financial affairs of the Royal Mail Steam Packet group, which have been under a cloud for some time past, have been considerably improved by the appointment of a committee which includes Walter Runciman, the son of Sir Walter Runciman, the veteran Tynside shipowner, who has a magnificent reputation both as an economist and a business man. It is, of course, impossible to expect an immediate improvement all round, but the market is obviously relieved.

Charter Rates Improved

With regard to charter rates, there has been a slight improvement, although it is very slow and will have to go a long way further before the shipowners can see both ends comfortably meeting. Tanker rates, on the other hand, which held out longer than any other branch of the market, are heavily depressed, owing to the huge number of tank ships which have been built, mostly for Scandinavian owners, who intend to time charter them for long periods. The financial stability of many of these contracts is more than a little doubtful and is causing considerable anxiety among the builders who accepted them.

With freights in that condition it is only natural that more and more shipping is being laid up, and the figures for Great Britain have proved to be much higher, as was foretold in the last summary. On Jan. 1 there were 167 ships of 352,359 net tons laid up in British waters, while on April 1 the number was 416 of 892,154 net tons, an in-

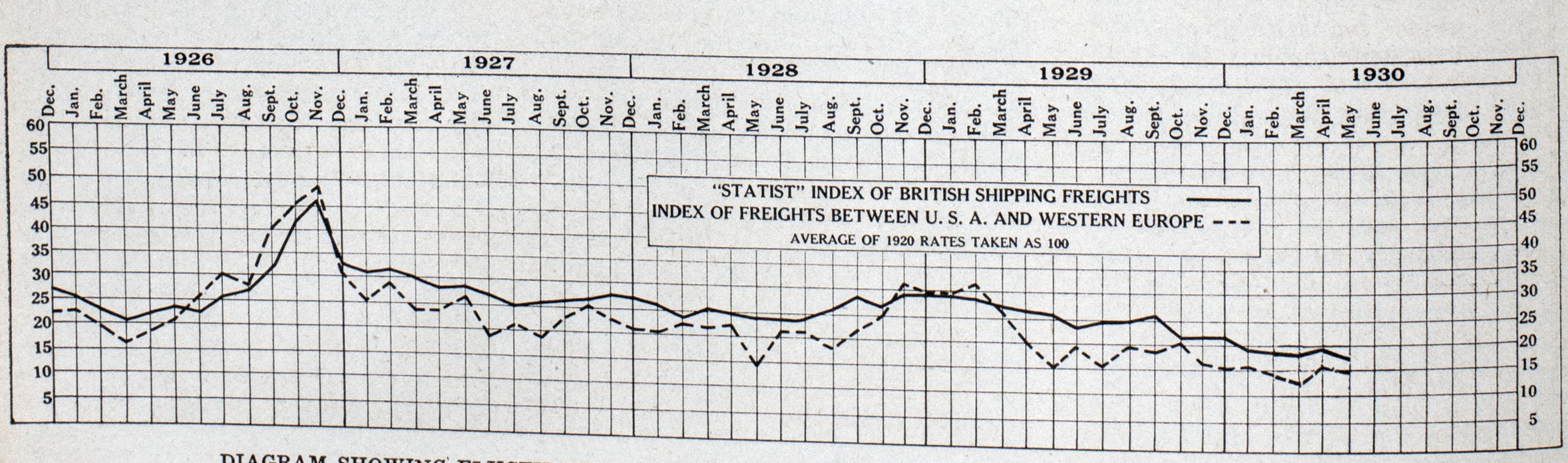


DIAGRAM SHOWING FLUCTUATION OF FREIGHT RATES FOR FOUR YEARS AND FIVE MONTHS

crease of over 150 per cent. Since April 1, however, quite a number of the smaller general cargo ships have been chartered to Russia for the movement of timber, but not nearly enough to make very much difference to the market.

Ships also are being laid up in most of the continental countries, a tendency which is particularly conspicuous among the big sailing ships which still are at sea under the Finnish flag. The freight rates offered to the last Australian grain fleet were so disappointing that Captain Eriksen, the principal shipowner, sent several of his big windjammers home in ballast, to lay up as soon as they arrived in the Baltic.

Many owners also are selling their older tonnage to the shipbreakers at a big financial sacrifice, as it appears impossible to hope for better things for some time to come, at least for the less efficient tonnage. An example of how scrap prices have gone down is shown by the fact that the Cunard cargo steamer BRESCIA only fetched £3850, while in 1928 her two sisters fetched £8500 apiece. The Canadian Pacific MONTROYAL, originally the record-breaker EMPRESS OF BRITAIN, is among the noteworthy ships which have been bought by Norwegian scrappers.

Merchant Fleet Report Shows Savings

THE report of J. R. Gordon, president of the Merchant Fleet Corp. for the quarter, April to June inclusive shows that a constant improvement is being made in the operation of this government agency.

New lump sum agreements are being negotiated with all North Atlantic operators except the lines which have been advertised for sale. Such an agreement has been consummated with Rogers & Webb: Consolidated Navigation Co., and Roosevelt Steamship Co. Under this new form of agreement a material reduction in losses will be made. Definite results obtained in the case of the lump sum contract with the Southgate Nelson Corp. justified the anticipated improvement.

Thirty-one vessels of 273,627 tons were sold during the last quarter for operation and scrap for the sum of $692,808. A recent survey of all idle vessels in the fleet indicates that 91 additional vessels are now available for scrap. During the fiscal year a total of 124 vessels of 879,362 deadweight tons were sold for $5,095,258. No bids were received to the advertisement for the sale of Gulf-Brazil line.

A reduction of $257,715 or 8.06 per cent has been made in the annual pay roll of the Merchant Fleet Corp. since March 31. For the entire fiscal year there has been a reduction in pay roll of $1,376,859 or 31.8 per cent. Further reductions in personnel will be made as the lump sum agreement becomes generally effective. Offices at Sydney, Australia and Pernambuco, Brazil have been closed.

The average monthly repair costs for the past six months show a reduction over the previous six months of $194,000 per month.

During the second quarter the insurance fund was applied to 61 steamers in total amount of $24,500,000. Earned premiums for this period amounted to $275,000 while 36 losses were settled through payment of $175,000. Arrangements have been made to continue the present rates for personal and indemnity insurance after June 30 when the current contract expires.

Hog Island who sold to the City of Philadelphia for $3,000,000 with the understanding that the property is to be developed as a marine rail and air terminal. The Hoboken piers have been advertised for sale and bids are to be received July 23. The property at 45 Broadway has also been advertised for sale and sealed bids are to be received as of Aug. 26.

Empress of Britain Launched at Clydebank

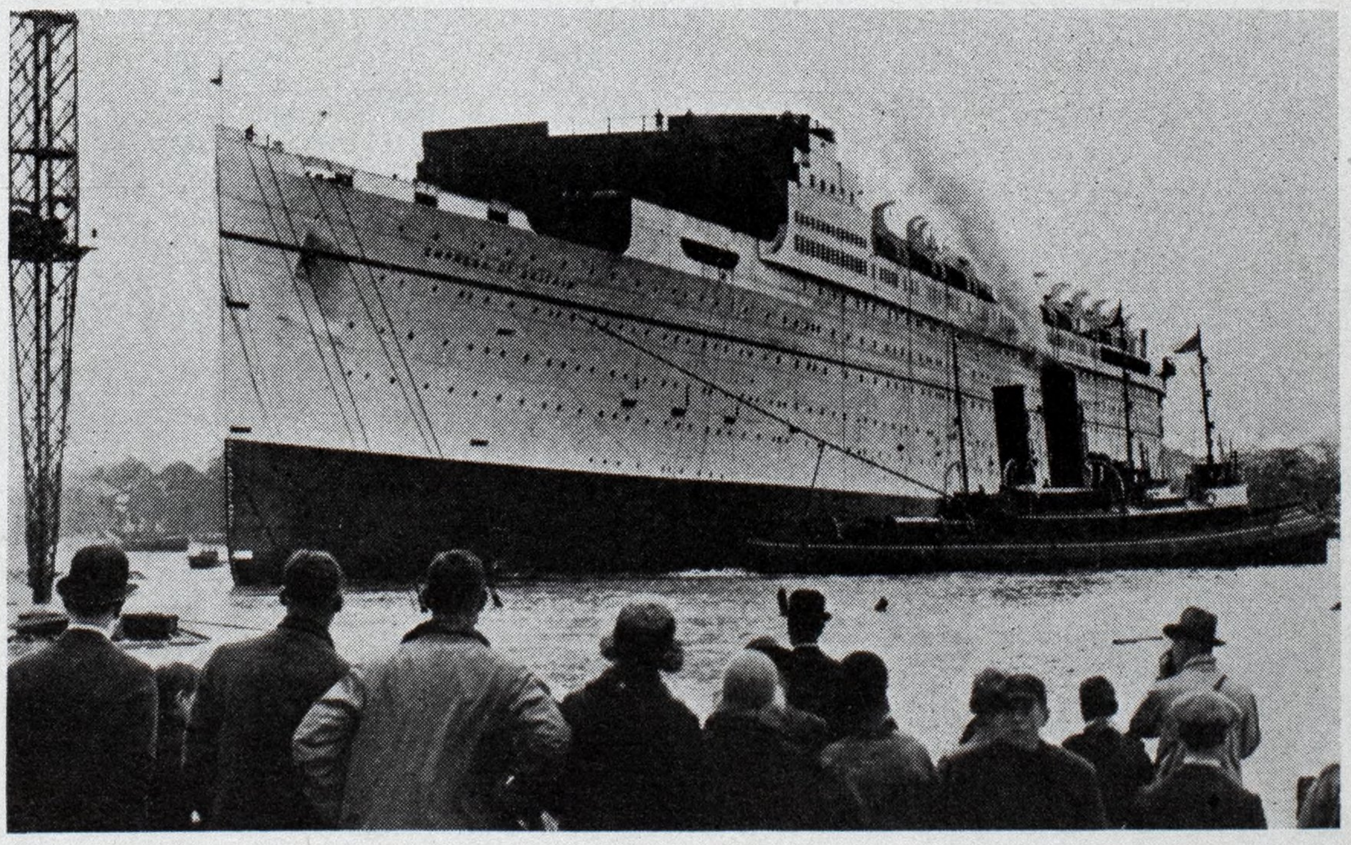
THE EMPRESS OF BRITAIN was launched June 11, at John Brown & Co., Ltd., Clyde Bank, Scotland. The new vessel is by far the largest ship yet built for the Canadian passenger trade and also the speediest. An average sea speed of 24 knots is to be maintained when she enters the Southampton-Quebec service of the Canadian Pacific Steamships Ltd.

Her length is 730 feet between perpendiculars; 755 feet in length on the load water line; 758 feet in length overall; beam molded, 97 feet 6 inches; depth to B deck, 60 feet 9 inches; load draft, 32 feet; gross tonnage about 42,500. Passenger capacity is, 452 first; 260 tourist; and 470 third class.

The EMPRESS OF BRITAIN had the distinction of being sponsored by the Prince of Wales. She is to be luxurious and in every respect one of the finest transatlantic liners. First class staterooms have been arranged for one and two passengers, each. Seventy-five per cent of first class staterooms each have either a private bath and toilet or shower and toilet. There are two de luxe suites of rooms comprising a sitting room, bedroom, veranda, bathroom, separate toilet, also a large box room. There are 18 special staterooms for two persons, each room having its own private bath and toilet. Bedsteads of large size are to be fitted in all first class staterooms.

It will be seen from this that in size, in speed and in the luxury of passenger accommodations, the EMPRESS OF BRITAIN will take second place to very few of the vessels in the world.

In propelling machinery, modern steam engineering has been utilized to the fullest extent. She has four propellers driven by single reduction geared turbines, steam for which is supplied by high pressure water tube boilers. Boilers are of the Yarrow design. It is anticipated that the fuel consumption will lie between .62 and .68 pound of fuel per horsepower per hour for all purposes.



Some Remarks on Tonnage as a Basis for Taxation

By Commander J. G. Bisset

IN THE year 1873 an international tonnage commission was held at Constantinople and reported as follows;—"It has been a traditional usage of all maritime countries to submit merchant vessels to a measurement, the result wherof, known under the general name of 'tonnage,' serves as the basis of the taxation to which a ship is, or can be made, liable everywhere and under any circumstances." An attempt to elucidate the mystery which surrounds the word tonnage, as used in shipping circles, may be welcomed by those who do not "use the sea," yet have found time during their sojourn on ship board to wonder at the disparity which exists between gross tonnage, register tonnage, displacement and deadweight.

First of all it should be clearly understood that the word "ton" used in this respect does not mean a ton weight in the sense in which the landsman uses the term. It is in fact a "tonnage unit" which represents a space containing 100 cubic feet, and is called a "ton of measurement." This unit has been generally adopted by most maritime countries as a practicable basis for levying charges on the ship. We will consider each of the tonnage terms in order, and the relation which they bear to one another will be readily apparent.

Gross Tonnage Defined

Gross tonnage. This represents the total cubical capacity of the vessel expressed in tonnage units. This result is obtained by adding together the following items: (1) Under deck tonnage. This represents the space below the tonnage deck, which, in ships having less than three decks, is always the upper deck, and in all other merchant ships is the second continuous fore and aft deck from below. (2) Between deck tonnage. This represents the cubical capacity of spaces between the tonnage deck and the upper deck. (3) The cubical capacity of all permanently closed in space on the upper deck such as passenger and crew accommodation, store rooms, forecastles, poops etc.

Register tonnage. This is obtained by making certain deductions from the gross tonnage, the principal ones being as follows: Propelling space which includes engine and boiler rooms, the shaft tunnel, and any spaces above deck for auxiliary machinery. Accommodation which includes living accomodation for the crew, but not passenger quarters; store rooms, sail rooms, chart rooms, wheel house and all such spaces exclusively used for the navigation and upkeep of the vessel. Other deductions can be made by complying with certain of Lloyds regulations as regards tonnage openings in the deck, size of hatchways etc. but these are too numerous and involved to be discussed in this article. It is on this register tonnage that practically all the dues to which a vessel is subject are paid, such as dock and harbor dues pilotage and light dues etc, and it will be seen that it is of considerable financial interest to the ship owner to reduce as far as possible this "basis tonnage" while still maintaining the size of his vessel. Register tonnage is supposed to represent the comparative freight-earnings capabilities of the vessel. It does not, as might be imagined, give any accurate idea as to the size of the vessel. An ordinarily proportioned vessel may have a certain register tonnage, while another of identical dimensions may have a very different register tonnage, depending chiefly on the difference in their structural arrangements.

Displacement. The first law of hydrostatics states that a body floating in a fluid displaces a volume of that fluid equal in weight to the floating body. Thus it will be seen that the displacement of a ship is its actual weight at that time. This may be expressed in cubic feet of water displaced, which is known as the "volume of displacement," and this figure divided by 35 will give the displacement in tons weight. It will be readily understood that this figure must vary with the condition of the ship, that is, whether she is light or loaded, in other words, whether or not she has on board cargo, fuel, water or other ballast, or any weight other than her structure.

Deadweight Tonnage Defined

Deadweight. The difference between a vessel's displacement in a light condition and any other, is deadweight. Deadweight capacity is really the carrying power of the vessel over and above the actual weight of the ship and her equipment. According to British law, every ship of over 15 tons burthen, sailing under the British flag must be registered, and certain conditions must be fulfilled. This custom dates back to the period when kings of England, in time of war, called upon merchants at various ports to supply vessels to be used as men-of-war, and it is from this origin that the British navy, as it is known today has grown. For many years, even after the custom of building ships exclusively as fighting units developed, it was usual to augment the fleet by drawing upon the resources of the merchant ship-owner, so that, in those days, there was no very clear line of demarcation between the royal navy and the merchant marine of the country. It is probable that the greater part of the fleet which met King Philip's armada, and shattered the glory of Spain, was drawn from this source. To be exact, Lord Howard of Effingham commanded the ships of Elizabeth's Navy, whilst Drake led his free-booters.

What Samuel Plimsoll Did

It would not be fitting to close a chapter on tonnage without mention of Samuel Plimsoll, whose unremitting efforts to render more secure the lives of British seamen entitle him to a place of peculiar honor among those who do business upon the great waters. It was entirely due to his forceful presentation of the conditions then existing in the mercantile marine, that in 1875 a royal commission decreed it necessary for every British ship, and every foreign ship trading to a British possession, to have painted on her sides a load line mark beyond which she must not be loaded. This mark is known as the Plimsoll mark, and its position is determined by experts after careful and abstruse calculation relative to the reserve buoyancy of the vessel. The mark consists of a white painted disc 12 inches in diameter through which passes a horizontal line one inch in thickness. The center line represents the extreme depth to which a ship, during summer months, may be loaded. Along side the disc will be found other horizontal lines showing the depths to which a ship may be loaded in winter, Indian summer, winter North Atlantic, and in fresh water. A ship of 20,000 tons gross if loaded in a fresh water river would rise approximately eight inches on entering the salt water of the open sea.

Commander Bisset is chief officer of the BERENGARIA of the Cunard line.

New Pier for Erie

The freight handling facilities of the Erie railroad at its Jersey City terminal are soon to be augmented by the construction of a new 1050-foot, two story, steel and concrete pier to be located immediately southward of the company's pier 9 which spans the New Jersey entrance to the Holland vehicular tunnel. Contract for the construction of this pier has been awarded to the Frederick Snare Corp, New York. Work is to be started as soon as possible.

Shipbuilding Quite Active Prospects Are Good

THE National Council of American Shipbuilders points out that though the industry is quite active, there are still more than 30 idle building ways and that the value of unfinished business on July 1, is less than it was on Jan. 1. Many contracts for new vessels have been considered during the past six months and 15 have been placed; two passenger vessels at about $21,000,000; seven combination passenger and cargo vessels at about $23,000,000; and six tankers at about $10,000,000. This makes a total approximate value in new contracts during this period of $54,000,000. Employment in shipyards has increased since the first of the year. There are now about 22,000 men engaged on straight shipbuilding work. More men will be added as the progress on contracts in hand continues.

Shipyards on the Pacific coast have not up to the present shared in the contracts for any of the vessels in the new shipbuilding program. Some of these yards are well equipped to carry on new construction work of practically any nature.

It is significant that while practically every vessel ordered has important provisions for cargo carrying, not a single new contract has been placed for vessels solely of the cargo type. Approximately 7,700,000 gross tons of vessels engaged in our foreign and domestic ocean trade are mostly of the purely cargo type. In the future a larger part of our shipbuilding program will by necessity be in the replacement and the addition of vessels of this type. Some action may be necessary to so amend the merchant marine act of 1928 that some commensurate aid be given ships of this class. The only help they receive at the present time is in the terms of the construction loan fund. This help is not sufficient however, to offset the differential in operating costs.

Contracts pending July 1, indicate that within the next few months further awards will be made for the construction of new vessels to the extent of at least $50,000,000. One feature which operates against American shipyards is the placing of American owned tonnage in foreign countries. A summary of such contracts shows, two passenger and cargo vessels under construction in Great Britain for the American Fruit Steamship Co.; a total of six 16,000-ton motor tankers for the Standard Shipping Co. as follows, three in Germany, two in Great Britain and one in Italy; two motor tankers for the Atlantic Refining Co. in Great Britain; and one 410-foot yacht for an unrecorded owner in Germany.

Lump Sum Operation

The shipping board on July 9 approved the recommendation of the Merchant Fleet Corp. and authorized the signing of a lump sum agreement with C. H. Sprague & Son, Boston, for the operation of the American Republics line which plies between Atlantic ports of the United States and ports of the East Coast of South America, on the basis of a payment of $10,000 per voyage, the operator assuming all repairs whatsoever up to $4,000 per voyage.

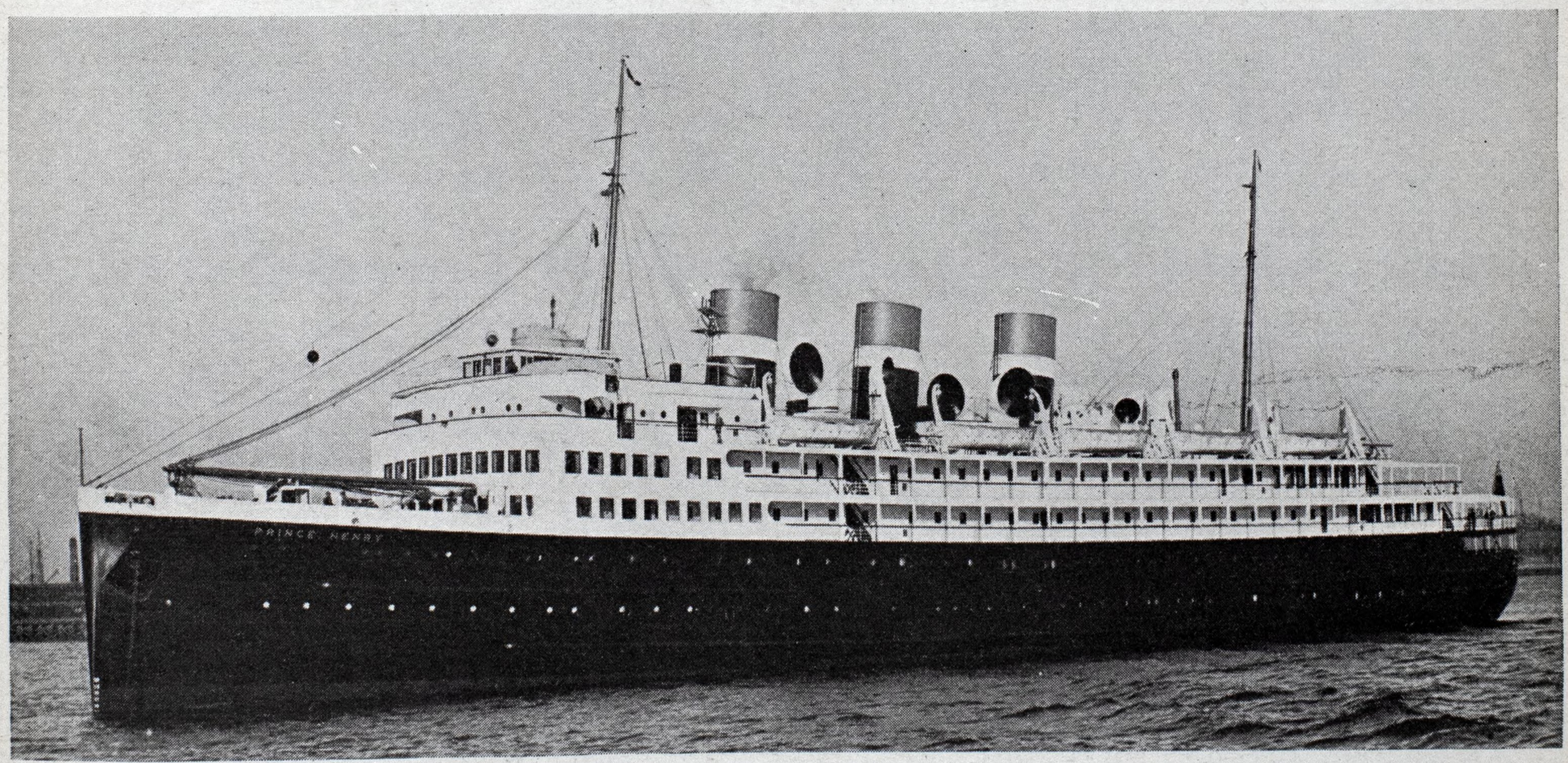
Raiser of Abandoned Ship May Claim Ownership

RECENTLY a reader of MARINE REVIEW, having in mind undertaking a definite piece of salvage work, wanted to know; "If a tugboat is sunk in navigable water and abandoned can it be raised and ownership claimed by the one who raises it? If it is raised without owner's consent can the raiser hold the cost of raising against the boat?"

The question was fully answered by a decision in maritime law reported on page 49 of the January 1929 issue of MARINE REVIEW. Briefly these paragraphs state that a wrecked vessel after abandonment has no owner and that it is well settled that a shipowner whose vessel has been wrecked and sunk without his fault has a right to abandon it and after abandonment he is under no obligation to raise or remove it.

From the above it is clear that the raiser of the vessel acquires ownership—speaking generally. If, however, because of special circumstances or facts, the original owner should claim that there was no abandonment of the vessel, and this claim can be substantiated, the raiser would be entitled to file a salvage claim and recover for services rendered without the aid owner's specific consent. If the company that originally owned the vessel "is out of business and can't be found" the raiser seemingly has nothing to fear in the way of a claim of ownership.

L. S. Devos recently was appointed sales manager for the Standard Motor Construction Co., Jersey City, N. J., builders of diesel engines.



Prince Henry—Twin Screw Turbine Reduction Geared Passenger steamship of the Canadian National Steamships now in service between Vancouver, B. C., and Alaska—Speed 23 knots—Length overall, 384 feet 6 inches; beam molded, 57 feet; depth molded 20 feet 8 inches; Load draft, 16 feet 6 inches. Built by Cammel-Laird & Co. Ltd., Birkenhead, England. One of three sister ships.
See Marine Review for May, page 36 for full particulars

Pewabic Disaster Recalled

Sixty-five Years Ago—125 Lives Lost

BY CARLOS C. HANKS

THE month of August this year, brings the sixty-fifth anniversary of one of the worst single disasters in all Great Lakes history, for it was on Aug. 9, 1865, that the passenger steamer PEWABIC was sunk, with the loss of 125 lives, in collision with another passenger steamer, the METEOR, off Thunder Bay island Lake Huron.

A drizzle of rain was falling, and a light mist dimmed the horizon that day, but both vessels, the south-bound PEWABIC and the north-bound METEOR, were plainly visible to watchers on the island. Each vessel was also seen aboard the other, for the prescribed passing signals were blown. Passengers, among them soldiers from the fort at Mackinac island, lined the rails and waved at the approaching ship.

Suddenly the PEWABIC sheered to starboard and swung across the bow of the METEOR whose iron-sheathed stem crashed into her side. For several minutes the two vessels hung together; long enough for some of the PEWABIC'S passengers to climb aboard the METEOR. Then they drifted apart, and, with a gaping hole in her side, the PEWABIC quickly filled and sank in 180 feet of water, carrying with her all those trapped in her cabins.

Many unsuccessful attempts were made to salvage the PEWABIC'S cargo of 500 tons of ingot copper during the ensuing years. Several divers lost their lives, and in two or three cases, storms wrecked the barges engaged in the work. In 1900 a Milwaukee wrecking company brought a crude diving bell to the scene of the wreck, and succeeded in raising a few tons of copper. The bursting of the bell by water pressure, and the killing of the two men in it, wrote finis to this attempt.

It was not until 1917, that a new expedition sought the PEWABIC'S riches. This time, B. F. Leavitt of Toledo brought up many tons of copper by means of a special clam shell, while a diver was able to explore the saloon and cabins. He found and brought to the surface, many relics of the disaster. A silk gown, almost as good as the day the water closed over the steamer, was found. The coloring of cotton goods was as bright as when purchased. Several watches—an ancient revolver—square-toed shoes—coins—handmade lace, shawls and broadcloth—jet bracelets and combs—the steamer's silverware—checkers with which the passengers were playing—bottles of pop as sweet as the day they were put up—human bones—all these were brought to the surface.

Both steamers, then among the finest on the Great Lakes, were owned by the Pioneer Lake Superior line under the management of J. L. Whiting of Detroit. The METEOR continued to serve various owners on the Great Lakes for more than sixty years after the disaster. She was eventually cut down to a barge and renamed NELSON BLOOM. Her bones now lie under water in or near Toledo harbor, having been condemned and scuttled in 1927 while engaged in the coal trade between that port and Detroit.

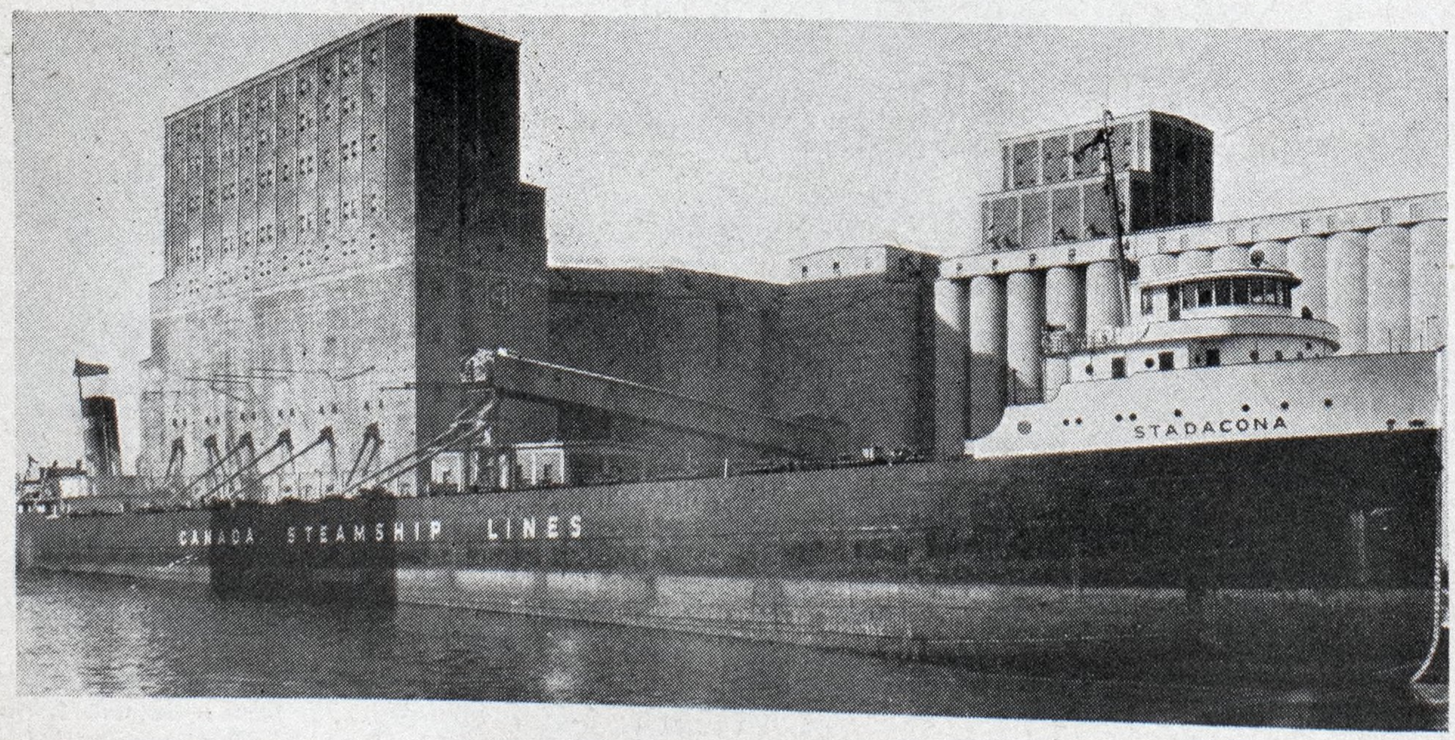
Representatives of the executive committee of the National Organization of Masters, Mates and Pilots of America and similar representatives of the Neptune association, met in New York recently to draft preliminary plans for the consolidation of these two old established organizations of navigating officers.

Gulf Lines Are Merged

The shipping board on July 16 approved recommendation of the Merchant Fleet Corp. under which seven lines being operated to European and Mediterranean ports will be rearranged into three units, one each to serve the Gulf-Mediterranean route, the Gulf-United Kingdom route, and the Gulf-Continental Europe route, except Gulf ports covered by the Mobile Oceanic line. This action was taken on the basis of surveys which revealed that these lines have now been developed to the point where the rearrangement will effect substantial economies in operation. In the selection of managing operators for the reestablished services, lump sum operating agreements will be negotiated.

The lines which are effected are as follows: Dixie Ukay line, New Orleans to United Kingdom; Texas Ukay line, Texas ports to United Kingdom; Southern States line, New Orleans and Texas ports to Bremen, Hamburg and Rotterdam, Mississippi Valley European line, New Orleans to French Atlantic ports; Texas Star line, Texas ports to French Atlantic ports; Dixie Mediterranean line, New Orleans to Mediterranean ports; Texas Mediterranean line, Texas ports to Mediterranean ports.

Large Canadian Lake Freighter Enters Service



THE Great Lakes freighter STADACONA of the Canada Steamship lines launched at Midland, Ont., from the yards of the Midland Shipbuilding Co. last September. She went into service for the first time in May of this year with 421,000 bushels of Canadian wheat pool grain from Fort William to Port Colborne.

She is 596 feet long with a beam of 60 feet. She has an electrically operated log and winches and is equipped with hatches suitable for the Lake Erie ore trade. She is commanded by Capt. J. F. Davis.

Pulverized Coal System Used on British Ship

INSTALLATION of the Todd system of pulverized fuel will be made in the British freight steamship INCEMORE of the Johnson line, one of the subsidiaries of Furness Withy Co.

The work is to be completed within 20 days and will be done at the Rockwall yards of R. H. Green & Silly Weir, Ltd., in London under the supervision from the Todd Shipyards Corp.

The Incemore was built in 1920 at West Hartlepool, England, and 360 feet in length, 52 feet in breadth, and 24 feet 6 inches deep. She is of 4098 gross tons, 2356 net tons and 6308 deadweight and is fitted with three scotch boilers with three furnaces each, and powered with resicprocating engines.

The new installation calls for three triplex pulverizers and burners in conjunction with the existing forced draft furnace fronts. A coal crusher will also be installed so that bunkers can be taken in any port.

Diesel Electric Tanker

THE accompanying illustration shows the recently completed tanker VEEDOL No. 2. This tanker was built by the Pusy & Jones Corp. for the Tidewater Oil Co. and is a sister ship of the tanker TIDEWATER, built by the same company for the same owners. The TIDEWATER is described in detail on page 42 of the April issue of MARINE REVIEW.

The VEEDOL No. 2 was completed May 8. She is a single screw vessel with diesel electric drive. Length over all is 267 feet; length between perpendiculars, 255 feet; breadth molded, 44 feet; depth molded, 18 feet 6 inches; and the draft is 15 feet 6 inches. Displacement loaded is about 3650 tons and the cargo capacity is about 935,000 gallons.

The main engines are two 6-cylinder, 4-cycle, solid injection trunk piston diesel engines built by I: P. Morris & De LaVergne, Inc. Each engine is direct connected to a General Electric direct current generator of 410 kilowatts at 250 volts and 225 revolutions per minute. There are two 45-kilowatt exciters at 240 volts. For propulsion there is one General Electric 1000 shaft horsepower motor, operating at 130 revolutions per minute at 500 volts. One auxiliary generator, also of General Electric make, of 45-kilowatt capacity at 350 revolutions per minute and 240 volts is direct connected to a 4-cycle, 3-cylinder, Winton diesel engine of 100 horsepower operating at 300 revolutions.

New Lightship Is Placed

ONE of the six new diesel electric lightships constructed for the lighthouse service, of the department of commerce, has recently been placed on its station off the coast of Washington, providing navigators with a more powerful light when approaching the ports of Seattle and Vancouver. At about the same time Umatilla Reef lightship, some miles to the southward, was also equipped with a more powerful masthead light and a modern type of radio beacon.

The new lightship will be known as Swiftsure Bank lightship, and is a modern steel vessel just completed and powered with diesel engines generating electric current for the main electric motors and providing electricity for all purposes on the ship. The masthead light will have 50,000 candlepower, much more powerful than the old light.

Umatilla Reef lightship will have the power of its lights also much increased, and will join the class of light vessels operating a radio beacon at regular intervals night and day, instead of sending out a signal only on request of a passing vessel, as formerly.

These changes in the aids to navigation will be of great benefit to shipping passing to and from the straits of Juan de Fuca, the approach to both American and Canadian ports. Dangerous reefs will be protected by more powerful lights, visible for many miles in clear weather, and by the most modern application of radio to the warning of vessels approaching dangers.

Special Telephone Adapted for Undersea Work

SPECIAL telephone equipment used amid the din of steamship engine rooms and industrial plants has been adapted for the silences under the sea. When Henry L. Bowdoin of New York, inventor of a new diving bell for salvage work, was preparing for recent tests of his apparatus he consulted engineers of the Charles Cory Corp. New York, a division of the Bendix Aviation Corp. seeking telephone equipment that would be water proof and insulated against deck noises.

The diving bell subsequently was equipped with sound proof telephones such as those used between the bridge and the engine room of steamships and in various departments of industrial plants. The telephones permitted constant communication with the parent ship on the surface, and none of the noise of the work on deck reached the operator in his sub-sea quiet.

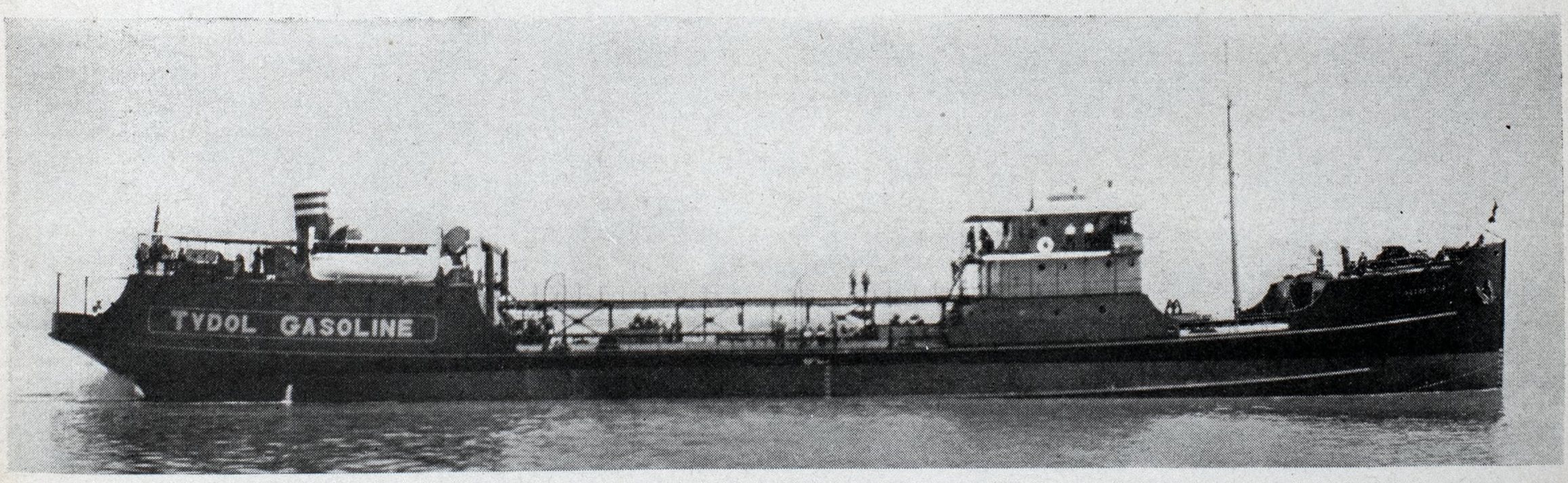
Wires were enclosed in water-tight cables. Bowdoin's experiments in Long Island sound lead the inventor to believe that he has perfected an apparatus that will permit salvage work at depths hitherto unreachable.

Houston Official Trials

THE light cruiser HOUSTON, built by the Newport Shipbuilding & Dry Dock Co., after successful official trials, was delivered to the United States navy on June 17, going immediately into commission.

Manned by a shipyard crew and in command of Capt. W. G. Melvin with Capt. Roger Williams, vice president of the Newport News Shipbuilding & Dry Dock Co. in general charge, the U. S. S. HOUSTON departed from the shipyard on her official acceptance trials on June 1. Mr. Christiansen, was in charge of the machinery. The vessel arrived at Rockland, Me. about 4:00 p. m., June 2, where the navy trial board embarked.

The standardization run over the



Diesel Electric Tanker Veedol No. 2 Completed May 8 by Pusey & Jones for the Tidewater Oil Co.

measured mile followed. Beginning at 10 knots, three runs over the course were made at each of several speeds, concluding at 25 knots. The anchor windlass test was then made in deep water. The following day five official runs at full power were completed. The greatest speed was 33.74 knots and the maximum power developed was 114,104 shaft horsepower both figures setting a new record for United States naval vessels of this class. Then followed the four-hour economy run at full rated power, the two-hour maximum power run, and two astern runs under maximum backing power, a record being made when the ship backed over the course at 22.46 knots.

Fuel guarantee runs at lower speeds were made on the homeward voyage. These guarantees were all met with comfortable margins. Remaining tests, figure eight steering, full power backing and steering and "no penalty" runs at cruising speed were concluded by the time the HOUSTON arrived at the shipyard at Newport News 6:00 a. m. June 7, bringing to a close one of the most successful trials in the experience of the shipyard and also setting a record for elapsed time for a tryout of a major ship before acceptance.

Vessels Show Speed on Various Runs

The new Canadian National Steam ships passenger steamer PRINCE HENRY, established a record on her maiden trip from Vancouver to Skagway, Alaska and return during July. Her average speed was 20½ knots for the round voyage.

The steamer VANCOUVER, the seventh and last of the vessels, built by the Hamburg American line for its Pacific-Europe service, arrived on the Pacific coast early in July. Her average speed across the Atlantic to Cristobal was 16 knots and on the run up the coast from Balboa she averaged better than 15.5 knots.

The American Scantic liner ARGOSY when she arrived in Copenhagen on July 9 completed one of the fastest if not the fastest voyages ever made between New York and the Danish port, having made the crossing in 10 days, seven hours and 50 minutes, an average speed of 14½ knots. The ARGOSY is one of 11 vessels in the American Scantic fleet acquired by Moore & McCormack from the shipping board and is fitted with the new underwater streamline system, designed to increase the vessel's speed.

The Kerr line motorship SILVERMAPLE, after a passage of only 17½ days, returned to San Francisco from Cebu on July 3. She is the first vessel in the new express service between the Pacific coast and Manila, Singapore and Calcutta to have made the eastbound trip.

New Tankers to Have Modern Features

THE first American tankers to be built with double longitudinal bulkheads, in lieu of the single center-line bulkheads are now under construction for the Sinclair Consolidated Oil Corp. at the Fore River plant of the Bethlehem Shipbuilding Corp., Quincy, Mass.

Two 8400-ton deadweight vessels now on the way and scheduled for delivery in October and November are the VIRGINIA SINCLAIR and the HARRY F. SINCLAIR JR. They were designed by J. G. Johnson, marine superintendent of the Sinclair Navigation Co., with J. K. Robison a consulting engineer.

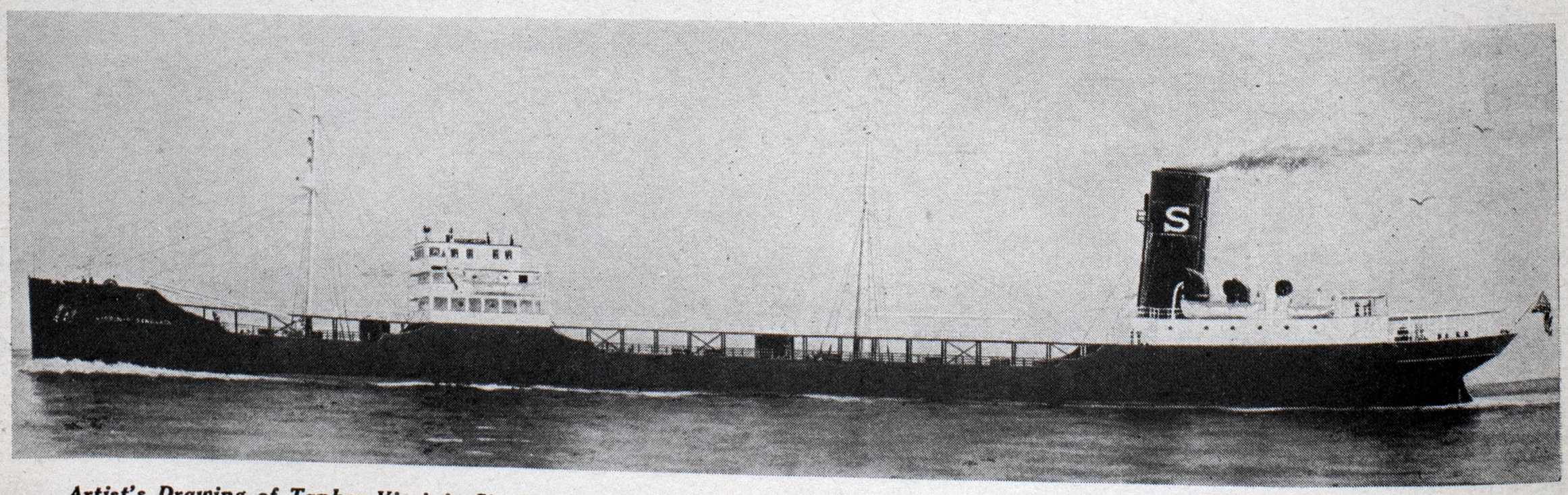
Sinclair officials believe that this departure, coupled with other innovations, marks a considerable advance over previous American and European tanker design. Advantages claimed for these vessels are greater stability, higher speed, virtual elimination of fire hazard, decreased evaporation losses, elimination of cargo contanmination, and reduced construction and operating costs. It is pointed out also that as a result of the higher speeds, the company will be able to reduce the average storage at terminals.

Methods and practices ordinarily used on naval cruisers and transatlantic liners are applied to hull design so far as these have been found adaptable to commercial service. Since the lines are faired and fine minimizing eddy losses and greatly reducing hull resistance, the 5000-horsepower driving machinery will permit a sea speed of 14 knots.

Other features are summarized by the Sinclair engineers as follows: "Summer tanks eliminated. Isherwood bracketless system of construction. Iron rivets throughout, to decrease corrosion, Sprinkling system covering entire deck. Cargo tanks fitted to withstand higher pressures. Vents at top of mast and fitted with flameproof spark arresters. Special methods of cleaning tanks. Vertical compound duplex steam pumps of high capacity; three pump rooms and three cofferdams, with separate lines and pumps to each cargo compartment. Double reduction gear turbines; steam generated in water-tube boilers at pressure of 400 pounds and with 200 degrees of superheat; engine room auxiliaries electrically operated; feed water heated in series heaters. Gyro compass; mechanical steering devices; full radio equipment for sending and receiving; compass direction finder; radio telephone connected with various living compartments of ship; submarine signal. Isolated hospital."

Each vessel will have a capacity of 67,000 barrels of cargo, 1000 tons of bunkers and considerable space for barrelled goods and package freight. They will be equipped to carry casinghead gasoline, and will ordinarily carry as many as seven grades of refined petroleum products in bulk without risk of polution.

The vessels are classed both in Lloyd's and American Bureau of Shipping, thus conforming to the highest standard of both major authorities on shipbuilding.



Artist's Drawing of Tanker Virginia Sinclair, Building for the Sinclair Consolidated Oil Corp. by Bethlehem Shipbuilding Corp.

Conveyors Speed Discharge of Copra at New Orleans

By Charles Lammond

IF YOU have seen an elephant draw water through his trunk and expel it forcibly over himself or the nearby landscape you can understand and appreciate how the new copra conveyor, in operation at the port of New Orleans, works. Its method of operation is practically identical, though on a considerably larger scale.

Copra, for the benefit of the unitiated, is the meat of the cocoanut Only the hull has been removed. Contained in the copra is the vital oil used in the manufacture of soaps by the Proctor & Gamble Co., at Ivorydale, O. Vessels from the Philippine Islands ply across the Pacific, through the Panama canal, up the Mississippi river to Chalmette slip, eight miles below New Orleans, carrying their copra cargoes.

Here at the Chalmette slip docks of the New Orleans Terminal Co. the copra is transferred from ship to cars by means of an electrically driven pneumatic conveyor, designed and installed by the Holly Pneumatic Systems, Inc., New York. The device was set up and began operations in February of this year. According to officials of the terminal company, it is the last word in modern conveyors, representing an investment of $60,000.

What is known as dock No. 2 at the Chalmette slip is a two-story concrete wharf, one side of which fronts on the land; the other side making available for the docking of vessels 1680 feet of the slip. On the land side of dock No. 2, clear of the wharf, there are two railroad tracks which serve the copra conveyor.

Loads 100 Tons an Hour

Each conveyor unit consists of an electrically driven blower, located in a power house outside the two tracks; a recipient, which is an elevated hopper erected between the two tracks; and ncessary pipe connections. A 14-inch pipe line leads from blower to recipient, thence over roof of dock No. 2 to the tower which rises over the vessel on the slip side. From the tower, a 12-inch flexible pipe descends into the hold of the ship, where the copra is stowed. From a trap at the bottom of the recipient, two 8-inch flexible pipe lines extend into box cars. In action the conveyor, elephant-like, draws copra through its long piping into the recipient, and blows it from its mouth direct into the cars.

There are two complete units, each having a separate and distinct blower, recipient, and pipe connections, which make it possible to work, with both units, two hatches at one time, loading four cars simultaneously. An auxiliary pipe line and tower leading from one of the recipients is so located as to enable the working of a third hatch without shifting the vessel.

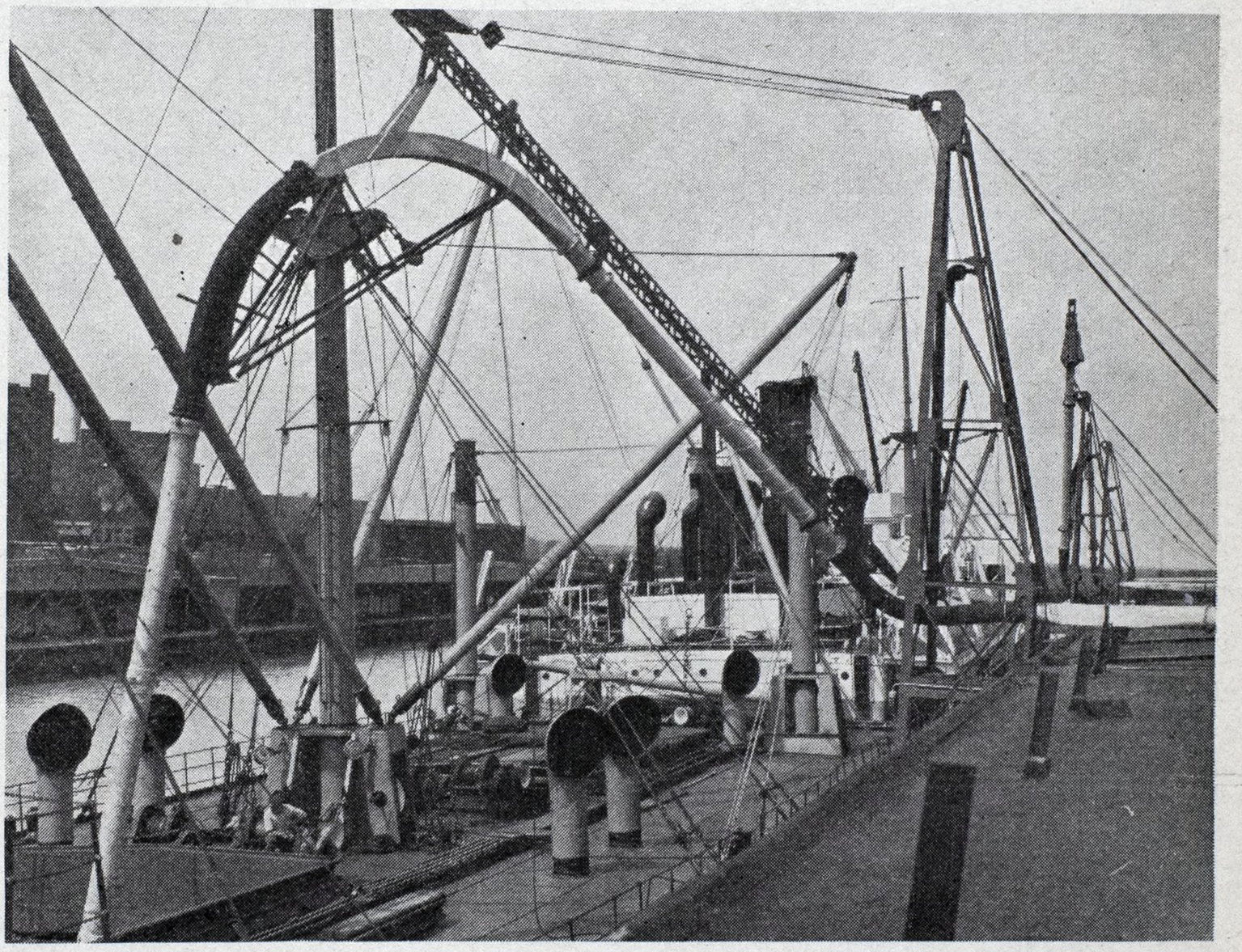
Each unit draws copra from vessel and at the same time loads into two cars at the rate of 50 tons an hour. With both units in operation, copra is being loaded into four cars at the rate of 100 tons an hour. While this speed is astonishing, sufficient conveying of copra has been accomplished to demonstrate the machine's capacity, in service.

The conveyor has been in operation since Feb. 26, 1930. Up to May 7 it had successfully unloaded from five ships a total of 11,589 tons of copra. The conveyor has proved a wonderful improvement over the old hand method formerly employed in transferring copra from ship to cars. As an illustration, a ship containing 3107 tons of copra was worked in five and one-half working days with the conveyor at Chalmette slip. By using the former method, the same vessel would have required eight and one-half days to discharge.

Hand Car and Buckets

The former method of handling copra was to drop a huge bucket from the winch of the ship into the hold; have men fill it with shovels; lift it up, and swing the boom over an elevated hopper on the wharf. Bucketful after bucketful was deposited in the hopper. From a trap at the bottom of the hopper, copra fell into a hand car which, when filled, was run across the dock to a box car and shoveled into the car. The copra was then trampled under foot to pack it in the car. This method, obviously, was slow, monotonous; and stevedoring was unduly expensive to ship operators. With this in mind, the New Orleans Terminal made the investment necessary to accord the new service to ships bringing copra to their docks; at the same time providing for more prompt movement of the copra from New Orleans to its destination.

Loading copra by hand it was possible to pack into a box car only, approximately, 60,000 pounds. The light load was due to inability to pack the copra close after it reached a certain height in the car, where the men could no longer trample it under foot. However, by adjusting the conveyor pipes the new facility stows copra in car evenly clear to top of car, and the terrific force with which it is blown into the car



DISCHARGING COPRA AT NEW ORLEANS FROM VESSEL'S HOLD OVER DOCK ROOF TO RECIPIENT FROM WHICH IT IS DELIVERED TO RAILROAD CARS ON SHORE SIDE OF DOCK

This article was prepared for Marine Review at the request of the Editor. The author Charles Lammond is attached to the staff of the New Orleans Association of Commerce.

packs it so compactly that carloads average about 80,000 pounds. This means less time lost in shifting cars, and speeds up the stowing process which is carried on at the same rate of speed with which copra is removed from the ship.

In accomplishing unloading in approximately 65 per cent of the time required by the former hand method, this facility effects a great saving to operators of vessels. Every day the vessel is tied up in discharging cargo means an additional expense to ship operators.

The conveyor installed by the New Orleans Terminal Co., a subsidiary of the Southern Railway system, is a step forward in port development, and should have a marked influence upon this valuable cargo moving through the port. The facility expedites service both to the importer and the ship operators.

Load Line Delegates Back from London

H. B. Walker, chairman of the American delegation to the recent International load line conference in London, who returned to this country on July 12, has expressed gratification over the results of the conference and the points won for American oil tankers and lumber carriers in world commerce.

"The technical points of interest to the United States," said Mr. Walker were the load-lines and conditions of assignment to be adopted for tankers, lumber carriers and ships of special types.

"By reason of load-line legislation in this country, American shipowners have had more latitude in loading cargoes than owners in other countries having definite load-line laws.

"Full consideration was given by the conference to the experience record submitted by the United States delegates, and the conclusion covered by the convention so far as tankers and lumber carriers are concerned are largely those put forward by the United States delegation.

"The convention as signed does not differ materially from the United States load line Committee's (1928) report to the secretary of commerce on April 18 last. The recommendations contained in that report were very largely adopted at the London conference.

"It was particularly gratifying to the United States delegation for the convention to adopt the principle of controlling the loading of vessels dependent upon the average weather conditions in all parts of the world, as was first proposed by the United States load line committee in 1921."

United States Second in Shipbuilding

WORLD construction of vessels is again below the pre-war level, due to a decrease of over 200,000 gross tons in the volume of work under way during the quarter ended June 30 last, says a statement just issued by Lloyd's Register of Shipping, covering returns of all maritime countries. As compared to the situation at this time last year, however, the present world total construction figure of over 3,000,000 gross tons shows an increase of more than 200,000 tons.

While the gain for the shipyards of the United States during the last quarter was only 15,000 gross tons, the increase was sufficient to place this country second to Great Britain in volume of shipbuilding, displacing Germany which had had a long tenure of second place.

Comparison of conditions in the last two quarters is shown in the following table, the figures representing gross tonnage:

Place	June 30, '30	Mar. 31, '30
Great Britain & Ireland	1,392,063	1,614,993
United States	238,163	222,974
Other countries	1,427,509	1,427,962
World total	3,057,735	3,265,929

At the end of June, 1929, Great Britain and Ireland had 1,450,000 gross tons of shipping under way; the United States, 119,098 tons, and the other maritime countries combined, 1,265,000 tons, making the world total at that time, 2,838,000 tons. During the past year the United states has doubled its volume of shipbuilding, while that of Great Britain and Ireland has declined in the face of a gain by other maritime nations. While the present production of the United States is still materially below that of Great Britain and Ireland, the gap is almost 200,000 gross tons less than it was a year ago. At this time last year Great Britain and Ireland were building more than the United States and all other countries combined, the proportion being 51.2 per cent; but their share of the world production at present is only 45.5 per cent. In the same period the share of the United States in the total output has grown from 4.2 per cent to 7.8 per cent, and that of the other countries combined from 44.6 per cent to 46.7 per cent.

The comparison between new work and that being sent towards completion during the past two quarters is shown in the following tables of gross tonnage:

	June 30, '30	Mar. 31, '30
Great Britain & Ireland	466,298	343,760
Other countries	405,771	295,980
World total	872,069	639,740

New Work	June 30, '30	Mar. 31, '30
Great Britain & Ireland	227,206	425,987
Other countries	343,419	408,801
World total	570,625	834,788

Construction of tankers continues to be an increasingly prominent factor in world shipbuilding, steam and motor vessels of this type, of 1000 gross tons and upwards showing an increase during the quarter just ended of about 225,000 tons over the preceding quarter, and a gain of over 770,000 tons over the total of tanker tonnage being built at this time last year. Nearly 60 per cent of the total tanker building at present is being done in Great Britain and Ireland.

The general comparison of tanker tonnage during the past two quarters is shown in the following table of gross tonnage:

Place	June 30, '30	Mar. 31, '30
Great Britain & Ireland	633,577	558,778
Other countries	476,479	328,106
World total	1,110,056	886,884

Of the world output of tankers nearly 90 per cent is now being motorized, through equipment with internal combustion engines. This condition does not prevail in the United States, however, as is shown by the following table showing the part played by motor vessels at present in the total tonnage of tankers under way:

Place	Motor Tankers	Total Tankers
Great Britain & Ireland	570,627	633,577
Germany	133,745	142,845
Sweden	133,745	89,350
United States	26,700	76,200
Other countries	154,884	168,084
World total	975,306	1,110,056

Germany's present total tanker figures show an increase of 58,000 gross tons over the previous quarter, and Sweden shows a gain of 32,000 tons, while the gain for the United States was only slightly more than 2000 tons. The other counties, taken together, made an advance of 55,000 tons.

Motor vessels generally continue their steady advance over all other types of merchant ships combined. Figures show that at the end of the quarter ending June 30, nearly 63 per cent of all the construction under way was of vessels to be run with internal combustion engines, as compared with less than 60 per cent in the previous quarter, and 50.5 per cent at this time last year. It is also noted that while the total motorship building at the end of the June quarter was only 10,000 gross tons less than in the previous quarter, the present total for vessels of all other types combined shows a decrease of nearly 200,000 tons. The

(*Continued on Page* 58)

Vessel Converted for Use as Floating Power Station

NEW ENGLAND is to have a new kind of electric generating plant—a floating one that can be towed to whatever section of the territory is in need of additional power. A very large part of the energy required by the subsidiaries of the New England Public service Co. is supplied by water power; but it is necessary to have a certain amount of steam auxiliary to furnish service in time of drought or in case of interruption of transmission lines.

By installing the generating equipment on shipboard, additional reserve capacity has been made available at any one of several points along the New England coast approximately twice as many hours of use of the investment can be secured in a term of years when compared with a stationary generating plant. As fixed charges are an important part of the cost of energy from a stand by plant, this increase in the number of hours of operation should reduce the kilowatt-hour cost.

Plentiful Supply of Cooling Water

Among the expensive features of the usual generating plant are the foundations and the provisions for condensing water into and out of the power house. In the case of a ship, the condensing water surrounds the plant, and it is necessary only to bring the water through the side of the hull and pass it out through the other side after it has gone through the condenser.

The JACONA, the vessel on which the generating equipment is being installed at the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., was originally a cargo vessel of 7000 tons, 380 feet in length, 50 feet beam and 26 feet draft, and was purchased from the United States shipping board.

The installed capacity of this floating power house will be 20,000 kilowatts and will consist of two General Electric turbine generators, each rated 10,000 kilowatts and operating at 3600 revolutions per minute. These turbines are of the latest design and are standard power house machines in every respect, and the only unusual feature involved is that they will be installed in a ship instead of in a central station. The turbines operate on steam at 400 pounds pressure and 250 degrees superheat and exhaust into condensers at one inch mercury back pressure. With these good steam conditions the steam consumption is between 9 and 10 pounds per kilowatt hour. The turbines will drive direct connected 10,000-kilowatt generators which will produce 60-cycle power at 6900 volts delta, or 11,930 volts Y. The generators will employ the closed system of ventilation and the circulating air will be cooled by General Electric surface air coolers, through which sea water circulates.

Latest Type Marine Boilers

The boiler equipment will be four Babcock and Wilcox marine type water tube boilers, capable of furnishing 240,000 pounds of steam per hour at 425 pounds and 250 degrees superheat. They will be oil fired, each furnace being equipped with 11 Babcock & Wilcox burners of the Cuyama design. The furnace walls will consist of Babcock & Wilcox 80-pound fire brick and special insulation. Each boiler will be equipped with air preheaters. The boiler plant is planned to develop 83 per cent efficiency. Two boilers are equipped with resuperheaters to provide steam for heating fuel oil and for miscellaneous purposes. All boilers, superheaters and air heaters are equipped with Diamond soot blowers. Both forced and induced draft fans will be used, and two boilers will be connected to a short steel stack.

The center of the vessel is occupied by steel tanks. One will be used as a water tank, the other as a surge tank, holding a supply of hot water in emergency for boiler feed purposes. The makeup water will be supplied by a shore connection, and will be passed through evaporators for purification. All water for boiler feed goes through feed water heaters for temperature control, and is deaerated.

The boiler plant will be forward and room will be left for possible future coal crushing equipment. The turbine equipment will be aft, and the switchboard equipment occupies the intermediate deck toward the stern. The crew's quarters fore and aft are the cabins on the upper deck amidships, will not be disturbed.

Vessel Will Be Towed

One mast will be unshipped to provide room for the boiler stacks; and the other, which is equipped with boom and hoists, will be kept in place to assist in installing turbine and condenser equipment. Condensing water connections will be arranged on both sides of the hull.

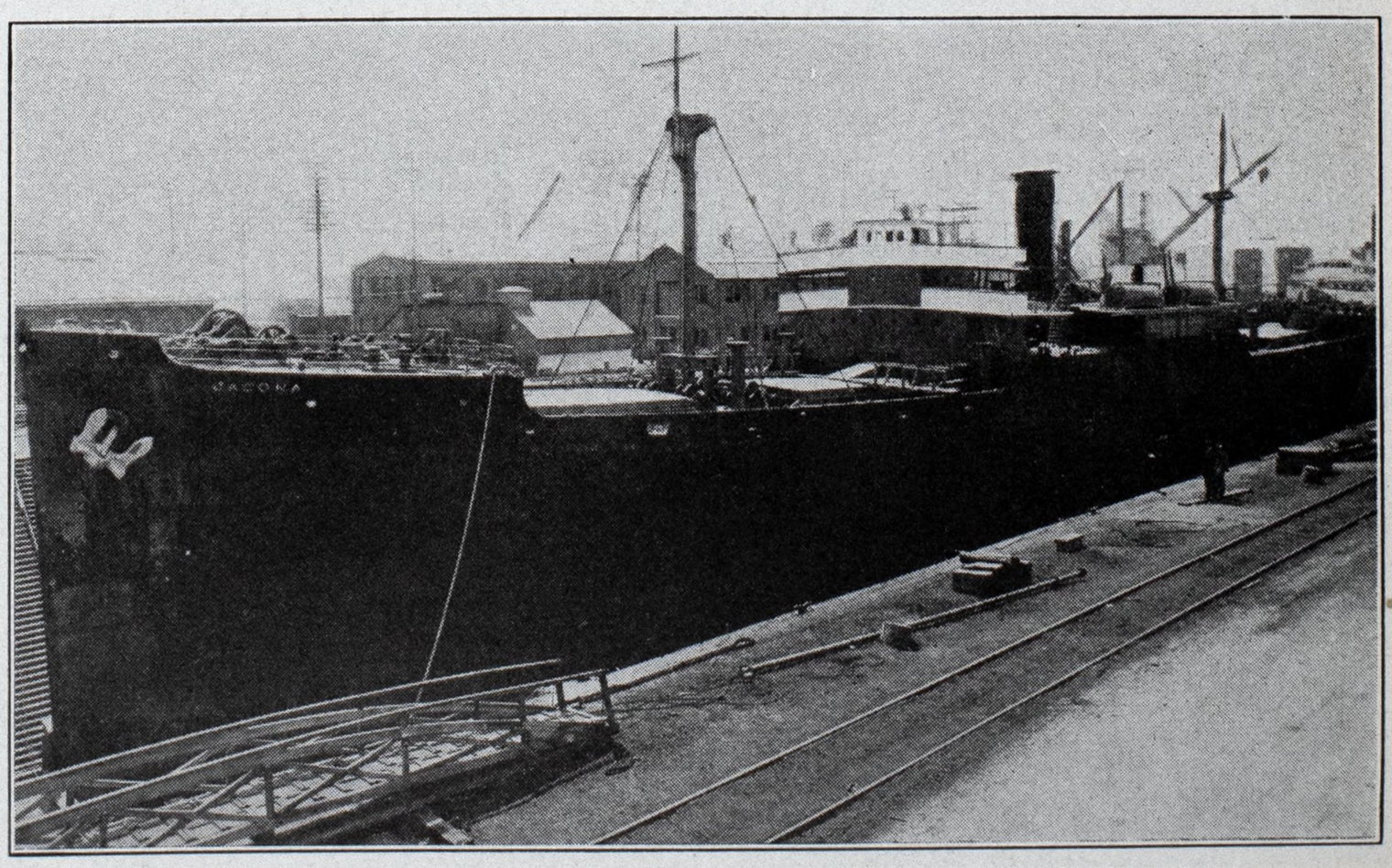
The JACONA was an oil burner, equipped with a double bottom and space for both oil and water storage. These tanks will probably be used for water ballast to trim, ship and give proper weight. In addition, there are ballast tanks in both the bow and stern.

It is proposed to tow the vessel to its berth, and to make water, oil and electric connections to existing facilities ashore.

Francis J. McDonald

Francis J. McDonald, president of the Ericsson line and former head of the Kensington Shipyard & Dry Dock Co., which was affiliated with the old Cramp shipyard at Philadelphia, died on July 17. He was 64 years old and had been ill for several weeks. Funeral services were held at Ardmore, Pa. He is survived by his wife and a son, Francis J. McDonald Jr.

Mrs. Lillie B. Matson, widow of Capt. William Matson, founder of the Matson Navigation Co., died at Woodside, Cal., on June 24. Mrs. Matson was present at Philadelphia at the launching of the MALOLO, largest vessel of the Matson line.



FLOATING POWER STATION SERVES NEW ENGLAND

Reviews of Late Books

Freighters of Fortune, The Story of the Great Lakes, by Norman Beasley, cloth, 311 pages, 6 x 9 inches, published by Harper & Brothers, New York and furnished by MARINE REVIEW, Cleveland, for $3.50 plus 15 cents for postage and in Europe by The Penton Publishing Co., Ltd., Caxton House, London for 18s.

The story teller of ancient days was listened to, as is his modern successor, for at least two reasons; the substance of his tale and the manner of telling it. In both these respects this new book richly deserves the attention of those whose minds and hearts are stirred by achievement. In the bustle and hurry of modern life how little is appreciated the vast field of action which lay spread out before the first white men to visit the region of the Great Lakes of America.

From its earliest times the development of water transport on these great inland waters is told in outstanding episodes from real events. Mr. Beasley's book has all the charm of an absorbing novel and the substance of a historical narrative. Beginning at the time of the first French explorations, the French Indian wars, the war of the Revolution and the war of 1812, he presents a quick moving picture of adventure of fighting and of the first attempts at crude commerce, all of which helped to lay the foundations for what is today one of the richest and most powerful sections of the world.

The chapter headings tell vividly the ground covered: A Cockleshell Sets Forth to Conquer The Lakes; A Treaty Brings Peace — And Commerce; A Great Fortune Begins in Furs; Steam Comes to Replace The Slapping Sails; Copper and Iron— And The Rush Is On. Later follow other chapters: Other Fortunes Begin To Grow; "I've Got Wheat Aboard, I Have;" "I Wouldn't Give A Cent For All The Iron In Minnesota;" Andrew Carnegie Loses A Decision; The Romance Of The Schooner Is Over; The Only Durable Things Are The Intangible Ones; and then the last, the twenty-fifth chapter, is headed: They Have Come To These Lakes and They Have Not Looked Away. There are a number of excellent illustrations; some by the Canadian artist George A. Cuthbertson.

Most of the rugged, hard headed and lion hearted men who have contributed in opening up this vast wilderness, from the early soldiers of France to the present day giants of industry, are made to live as real human beings in these pages.

This book will be equally appreciated in the sailor's cabin on a lake freighter and in the home of the captain of industry, for it is not only a collection of strikingly interesting historical facts, but it is also a moving tale of human drama.

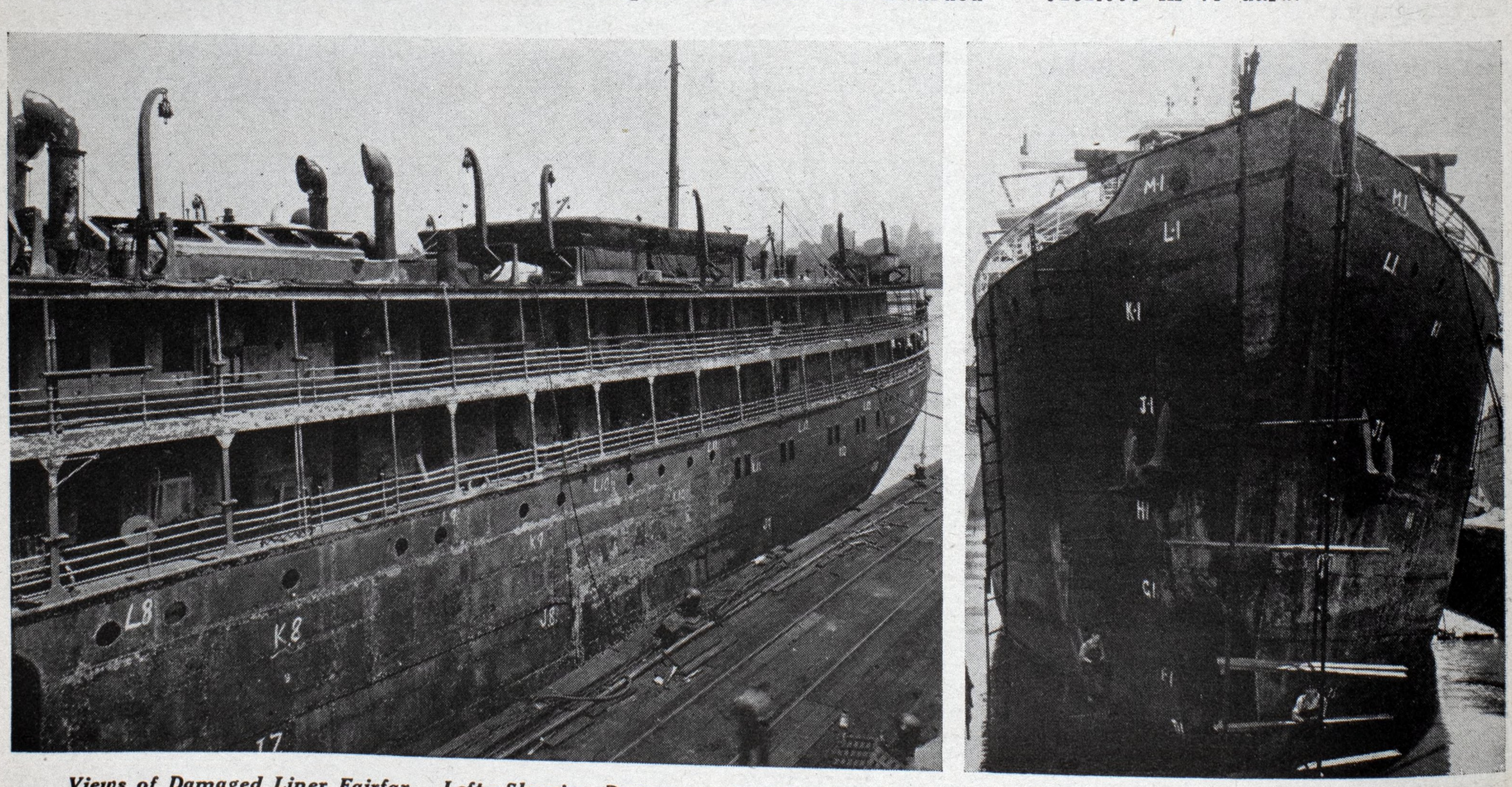
Recondition Damaged Liner Fairfax

THE steamship FAIRFAX of the Merchants and Miners line, a principal in one of the outstanding marine disasters of the year, is being reconditioned at the Fletcher plant of United Dry Docks, Inc., of New York. The ship will be ready for service again late in August, the company having agreed to do the job in 45 days at a cost of $109,900.

When the PINTHIS went down much of her cargo of oil spread over the water about the FAIRFAX and caught fire. The blaze leaped up the port side of the steamer and did extensive damage to the promenade and hurricane decks and exteriors of about 50 staterooms. Before the fire could be extinguished, it reached the boat deck where it burned out the dance hall and destroyed life boats and other equipment which must be replaced.

The repair contract was awarded on the basis of the following bids, which emphasize the spread between high and low figures.

United Dry Docks, Inc., $109,900 in 45 days; Bethlehem Shipbuilding Corp., $112,000 in 68 days; Sun Shipbuilding & Dry Dock Co., $146,287 in 80 days; Newport News Shipbuilding & Dry Dock Co., $123,500 in 60 days; Maryland Dry Dock Co., $149,382 in 85 days; Tietjen & Lang, $162.000 in 75 days.



Views of Damaged Liner Fairfax. Left—Showing Damage to Port Promenade, Hurricane and Boat Decks. Right—Hole in Bow

Becomes Commodore of Ward Line Fleet

CAPT. JOSEPH E. JONES, one of the best known skippers in the American merchant marine and for the past six years master of the ORIZABA, on July 20 was elevated to the rank of commodore of the Ward line's fleet and at the same time appointed to the command of the new flagship MORRO CASTLE which sails from New York Aug. 23 on her maiden voyage for Havana in which trade she will be regularly employed with her sistership ORIENTE which enters the run this fall. Captain Jones' interesting sea career began in clipper ships when he was a youngster. He sailed to many ports of the world as a seaman and officer and after acquiring a thorough knowledge in sail, joined the old Norton line as a third officer and saw service in the South American and European trades. He entered the service of the Ward line as third officer of the first HAVANA, which is not to be confused with the present HAVANA, the fourth of the company's vessels to bear that name. In April, 1903, he was appointed master of the CITY OF WASHINGTON. He assumed command of the ORIZABA in September, 1924.



CAPT. J. E. JONES

Commodore Jones estimates that he has traveled more than 2,000,000 miles since starting his sea career as a boy. During the years spent in the service of the Ward line he has made 430 round trips between New York and Havana in addition to numerous voyages in the company's Mexican service.

In 1911 when master of the Ward liner VIGILANCIA he rescued all the passengers from the old Atlas liner PRINCE JOACHIM.

Commodore Jones is now standing by his new command, which is receiving her finishing touches in the yards of the Newport News Shipbuilding Co., The MORRO CASTLE will run her sea trials off the Virginia Capes on Aug. 8 following which she will be delivered to her owners and taken to New York on Aug. 17.

French Line Promotions

Pierre de Malglaive, general representative of the French line for the United States and Canada with headquarters in New York, has been promoted to associate managing director in Paris, effective early in September This new position will place Mr. de Malglaive second in command in the operation of the French line organization throughout the world. He has been in charge of the American and Canadian branch of the company since 1923, having come to this country from Antwerp, where he was general manager for Belgium.

He will be succeeded by Jean Tillier, who has been acting as assistant representative to Mr. de Malglaive. Mr. Tillier is one of the youngest men ever appointed to so important a position in the shipping world.

Appointed Passenger Traffic Head

TARLETON WINCHESTER, former European passenger director of the United States lines, London was recently appointed passenger traffic manager of the lines and is now located at the headquarters of the company, 45 Broadway, New York.

Mr. Winchester is well known in the steamship business and has a wide acquaintance among the traveling public here and abroad. A former newspaperman and publicity director, he made a study of transportation and in 1920 took charge of traffic for the United States shipping board in London. Two years later, he was transferred to the United States lines and became European passenger director, in which capacity he served the company until 1929 when the government fleet was purchased by private interests. Since then he continued as European passenger director.



T. WINCHESTER

Mr. Winchester was born in Baltimore, and has lived in Baltimore, New York, St. Paul and London. He is also well known in the motion picture industry having been publicity director for a number of motion picture companies before entering upon his career in shipping.

George Washington Drydocks in Brooklyn



THE S.S. GEORGE WASHINGTON, second largest vessel owned by the United States lines, and the second largest vessel flying the American flag, recently drydocked in New York harbor for the first time. The new Todd dock at the Robins plant of the Todd Shipyards Corp., Brooklyn, N. Y., is the only drydock in the port of New York large enough to handle this huge vessel.

Previous to this the S. S. GEORGE WASHINGTON was forced to go to Boston navy yard for dry docking, necessitating an additional layup of two days.

Her tail shafts were drawn for inspection. Both propellers were removed, one being rebladed while the rudder was raised. Scaling, painting and renewal of rivets in the bottom tanks, as well as having a new plate fitted to the stern completed the job and the vessel again returned to service.

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

AMERICAN shipyards were building or were under contract to build 251 steel vessels, totaling 477,053 gross tons, on June 1, compared with 237 vessels of 357,158 gross tons on May 1, it was announced July 8 by the bureau of navigation of the department of commerce.

The bureau showed that there were 27 wood vessels of 10,889 gross tons building or under contract to build for private shipowners, during the same period. The tonnage is distributed among 29 shipbuilding companies, the largest steel quota going to the Sun Shipbuilding and Drydock Co., Chester, Pa., with 14 ships aggregating 108,472 tons, and the largest wood quota to the Brewer Drydock Co., of Mariners Harbor, Staten Island, N. Y., with 12 ships totaling 4500 tons.

The number and tonnage of other companies gave the American Bridge Co., Pittsburgh, 11 steel ships of 4156 tons; the Bethlehem Shipbuilding Corp., Bethlehem, Pa., 23 steel ships and 67,629 tons; the Dravo Contracting Co., Pittsburgh, 142 steel ships and 56,589 tons; the Newport News Shipbuilding Co., Newport News, Va., five steel ships and 92,600 tons; the New York Shipbuilding Co., Camden, N. J., seven steel ships and 95,725 tons; Ira S. Bushey & Sons, Brooklyn, one wooden ship of 250 tons; Federal Shipbuilding Co., Kearny, N. J., four steel ships and 24,950 tons; Jakobson & Peterson, of Brooklyn, five wooden ships and 1750 tons, and the American Car and Foundry Co., of Wilmington, Del., a wooden ship of 2000 tons.

To Lay U. S. Liner Keel

The keel of the first of two 30,000-ton liners which the United States lines will build as part of its $90,000,000 program will be laid Dec. 1, at the plant of the New York Shipbuilding Co. at Camden, N. J., it was announced recently. The keel of the second ship will be laid three months later.

The model of the vessels was tested recently at the model testing basin in Washington with satisfactory results. The plating model has been completed, allowing an early start on the shell plating, for which work 2200 tons of steel have been ordered from the Bethlehem Steel Corp.

Three hundred men have been employed on the preparatory details of the ships since May 24, when Paul W. Chapman, president of the United States lines, signed the contract for their construction, with the result that many patterns have been made and work has started in mold loft of the shipbuilding plant.

Plans now call for the launching of the ships early in 1932. When the vessels go down the sheltered ways they will be 90 per cent complete and all the propulsion machinery will have been installed. They will be finished in the basin of the Camden yard and the first of the two ships will be ready for delivery in July, followed by the second in November.

Loan Authorized

The shipping board July 11 authorized loans to the Baltimore Mail Steamship Co. in amounts aggregating $6,540,000 to be used in the reconstruction of five vessels purchased from the board for operation over a route between Baltimore and Hamburg under the terms of an ocean mail contract recently awarded the Roosevelt Steamship Co. of New York. Contracts covering the reconstruction work have been negotiated with the Federal Shipbuilding and Drydock Co., Kearny, N. J. and it is anticipated that the first of the vessels will be ready for service before the summer season of 1931.

The loan which has been authorized by the board represents approximately three-fourths of the cost of reconstruction and equipping the vessels as 16-knot passenger, cargo and mail steamers. Each of the ships will accommodate approximately 87 passengers and they will be operated on a weekly schedule out of Baltimore via Hampton Roads to Hamburg and Bremen, with the privilege of calling at French Atlantic and/or Channel ports. In addition to the outlay for reconstruction and equipment, the Baltimore Mail company will pay the shipping board $150,000 cash for the five vessels.

The ships themselves are large-sized steel cargo steamers. The reconstruction work contemplated will involve the modification of their hull lines and the installation of more powerful engines to increase their present speed. When ready for service they will be approximately 487 feet long by 56 feet beam by 24 feet draft, and of approximately 12,000 tons displacement. They will be equipped with geared turbines and will be capable of sustained sea speed of 16 knots. The plans for their reconstruction, which have been reviewed by the board and the navy department, call for the most modern machinery and equipment in every particular.

The route over which the new line will be operated has been reviewed by both the shipping board and the postmaster general, and certified to be an essential trade and mail route. This is one of the outstanding instances of a new line being undertaken by private initiative without the government having first taken the preliminary steps in its operation. The board feels that the management of the new line is competent to operate the line successfully and that this service will be a distinct addition to the American merchant marine.

Contracts covering the reconstruction work on the five vessels will be awarded as the result of competitive bids secured from shipyards by Gibbs & Cox, Inc. These were presented to the board in accordance with its policy of requiring offers from five or more yards.

Bids received are as follows: Federal Shipbuilding and Dry Dock Co., $1,674,000 each for five; United Dry Docks, Inc., $1,850,000 each for five; Norfolk Navy Yard, $2,137,000 each for two; Maryland Dry Dock Co., $2,261,652 for one; Bethlehem Shipbuilding Corp., Ltd., $2,531,000 each for two; Todd Shipyards Corp., $2,594,000 for one.

Work on Export Liners

The 7000 gross ton passenger and cargo steamer EXCALIBUR, first of four vessels being built by the Export Steamship Corp. for its New York-Alexandria service, will be launched at New York Shipbuilding Corp., Camden, N. J., on Aug. 5. The second vessel will be launched in the latter part of September.

Keels of the two other vessels will be laid as soon as the first two have cleared the ways. It is expected that the company will place orders for four additional ships following the completion of the first group. The vessels of the shelter deck type will be 450 feet long with a beam of 61 feet, 6 inches. They will be driven by triple expansion

(Continued on Page 56)

Shipping Committee Organizes

The advisory shipping committee recently appointed by President Hoover to review the long controversy over the bids submitted to the shipping board for the purchase of the America France and American Diamond lines has taken up quarters in the ground floor of the Navy building, Washington, and will make its New York headquarters in Room 734, Caxton House.

An organization meeting has been held and letters have been sent to the three bidders for the lines, the United States lines, the Cosmopolitan Shipping Co. and the Black Diamond Steamship Corp., asking them to submit documentary evidence to support their bids, including data on the financial position of the bidders, plans for operation and development of service, estimates of possible earnings and prospective construction programs.

The shipping board also has been asked to lay before the committee complete particulars regarding the bids received and the entire history of the case. Public hearings will be arranged to supplement the documentary evidence received under the foregoing schedule, and after a thorough study of all the evidence the committee will make its recommendations to the President.

Members of the committee are H. G. Dalton, Cleveland; Ira A. Campbell, New York; Edward N. Hurley, Chicago; George S. Jackson, Baltimore and C. M. Woolley, New York.

New Pacific American Flag Service

The Interocean Steamship Corp. on behalf of the States Steamship Corp., managing operators for the Pacific-Atlantic Steamship Co., announced on June 30 the establishment of the Pacific-Atlantic line to operate a regular direct service between Pacific coast ports and London, Liverpool and Manchester. The service will begin with the sailing of the steamer JEFFERSON MYERS from Vancouver on Aug. 16 with susequent sailings at intervals of 26 days.

At present there is only one American line, the ISTHMIAN, and 14 foreign lines operating in the Pacific coast-European trade and the new company will help develop foreign trade.

Carferry Windsor Launched at Toledo

THE double ended steel carferry WINDSOR, shown in the accompanying illustrations, built by the Toledo Shipbuilding Co. Inc. for the Wabash railroad during the winter and summer of 1929 and 1930 was launched on June 28 and will be completed sometime in August.

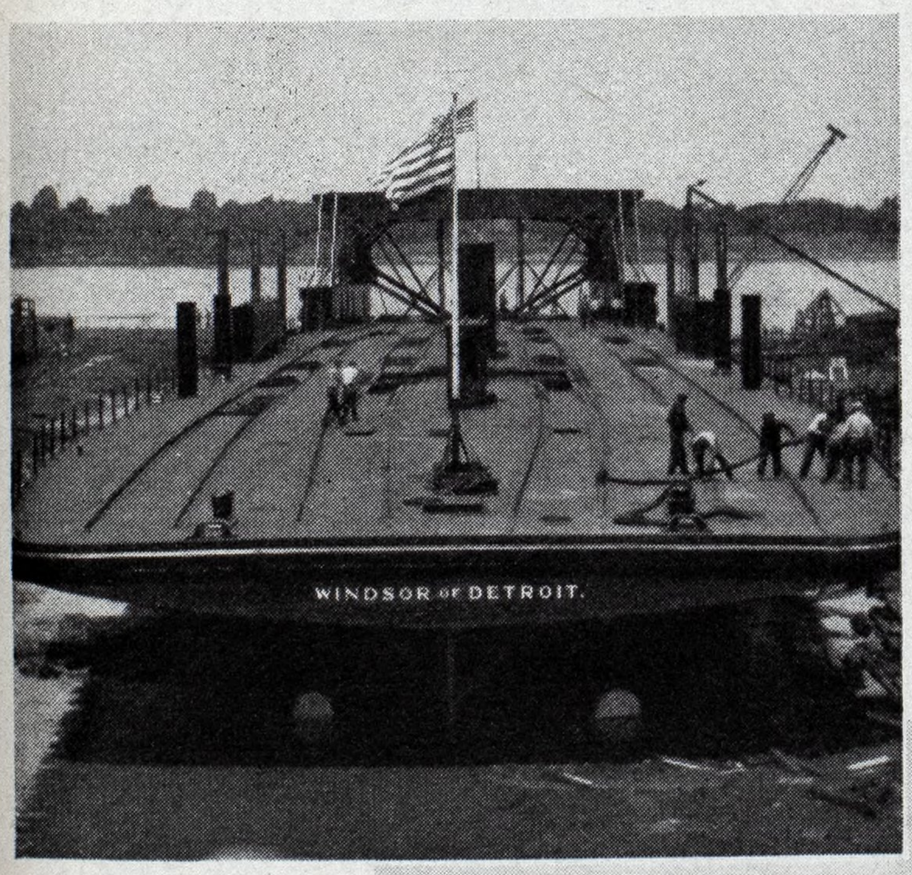
This vessel is 370 feet long overall, and 346 feet between perpendiculars. The breadth molded is 65 feet and the molded depth, 21 feet, six inches. The draft is 16 feet and the displacement loaded 6494 tons.

There are four propellers, two at each end made by the Toledo Shipbuilding Co. and driven by four separate three cylinder compound reciprocating steam engines 24 x 36 x 36 x 36-inch stroke. These engines develop a total of 5200 horsepower at 100 revolutions per minute. Steam is supplied by six single end Scotch boilers; 13 feet in inside diameter by 11 feet 6 inches length over heads, having a working pressure of 160 pounds. The Howden system of forced draft is used. Bunker space is supplied for 400 tons of coal which is used as fuel. The engine room is fitted with condensers, pumps and air compressors with which a boat of this type is usually equipped.

The deckhouses of the vessel are used as shelters only since no sleeping or eating accommodations are provided because of an eight-hour shift of the crews. At the forward end of the ferry there is a bridge which supports the pilot house. Under this bridge and on the deck, four tracks are laid for the accommodation of thirty-one 42-foot cars.

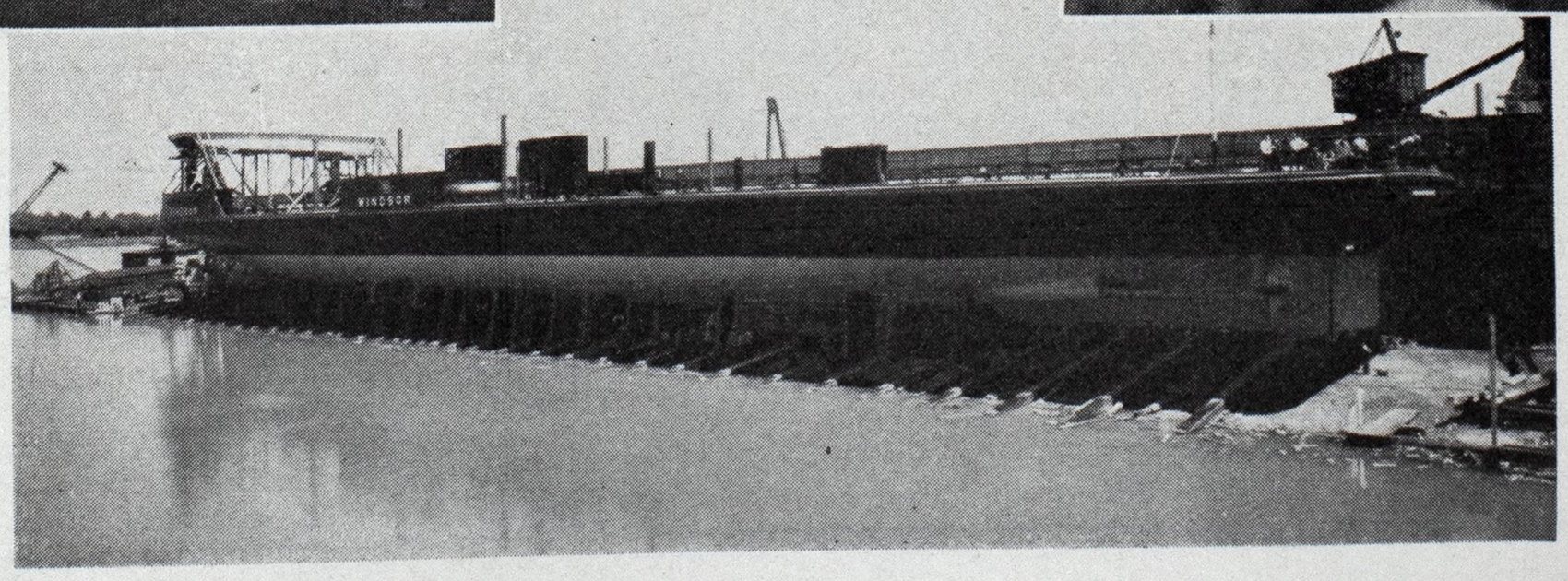
The pumps were supplied by Dean Bros. Co., Indianapolis, Ind. and the winches and steering engine by the Hyde Windlass Co., Bath, Me. The electrical generating systems were built by the Engberg division of the Troy Engine & Machine Co., St. Joseph, Mich.

This carferry is of heavy construction throughout and has been built for operation on the Detroit river





Left—Carferry Windsor Before Launching at Toledo Shipbuilding Co., Showing Rails on Deck. Right—Launching. Below—The Windsor on the Launching Ways



Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

WHERE a properly moored vessel is run down by a moving vessel, a prima facie case against the latter is made out by the mere fact of collision. * * * A fog may be so dense as to make the setting forth of a vessel into crowded waters a fault which will put upon her the risk of disaster, however careful her subsequent navigation may be—at least in the absence of some necessity for undertaking her voyage without delay. If it is the duty of vessels overtaken in a thoroughfare by a dense fog to come to anchor as soon as a permissible anchorage can be found, it must be equally their duty to refrain from setting forth into such a fog. If a fog is so dense that a vessel must keep within a few feet of the pier heads in order to know where she is, it cannot be prudent to set out.—QUOGUE, 35 F. (2d) 683.

* * *

THE rule of the common law, imposing liability upon an employer for an assault committed by one of his employees upon another, when the former is in a position of authority and acts within the general scope and line of his employment, obtains in the maritime law; and, in the case of Cain v. Alpha Steamship Corp., 35 F. (2d) 717, it was held that a shipowner was liable to a seaman for a wilful assault on the seaman by a subordinate officer acting in the scope of his authority and in furtherance of the ship's business, under the doctrine of respondent superior.

* * *

A BARGE which failed to keep to either the starboard or the port side of a channel, but relied on the channel's being clear because of the absence of a reply to its bend signal, was in fault in a collision with a steamship, irrespective of whether a custom calling for passing starboard to starboard on flood tide was applicable.—NASSAU, 35 F. (2d) 709.

* * *

WHEN as a bailee, a towing vessel received her tow in good condition and delivers it damaged, without being able to explain the damage, there is a presumption of negligence on her part, and she must be held liable. This principle has been repeatedly enforced in cases of bailment arising under charter parties.—DRIFTER, 35 F. (2d) 1006.

* * *

IN THE case of MORAN No. 16, 36 F. (2d) 76, in which libelant sought to recover contribution in general average, it appeared that upon the explosion of a lantern aboard a lighter and the consequent rapid spreading of flames, a call to a municipal fire department was sent in, and that the cargo was damaged by water thrown by the firemen. The court said, in part: "It should be recognized in considering a case of this nature that it would be contrary to the interest of all to unduly discourage the master of a vessel, when his ship and cargo are in danger from fire, because of the fear of technical legal complications, from calling to his aid municipal fire apparatus in his effort to save them; also that those who know them are aware that the average barge master is not a particularly competent or acceptable person to direct the methods of a modern fire department in its efforts to save his ship and cargo, and efficiency is what is wanted at such a time. * * * It is sufficient compliance with the rule that the sacrifice must be under the direction or concurrence of the master, if it appears that the fire department was summoned by him or some one in behalf of the vessel for the purpose of aiding him in saving the vessel and cargo from further damage from fire, unless it appears that the fire department's efforts were not confined to the purpose for which it was summoned.

* * *

WHERE a city fire department was called by an agent for the owners receiving notice of a fire in the hold from the first officer in charge of a vessel lying at a pier, under circumstances showing that the purpose was to save the particular ship and its cargo, the owners of the cargo were entitled to contribution in general average by reason of damage from water. The fire department, in acting at the request of the shipowner for the purpose of saving the particular ship and cargo and not of other property, acts as his agent whether it is paid or not. The shipowner, after damage to the cargo by reason of water poured into the hold, had the duty of requiring average bonds before delivering their shipments to shippers or consignees and to have a general average adjustment prepared.—BEATRICE, 36 F. (2d) 99.

* * *

DEVIATION of a vessel because of the lack of bunker coal, which was due in part to the poor quality of bunker coal which the charterer under the charter party was required to furnish and in part to unusual adverse weather, was not a detention by average "accident to ship," within the break down clause, it was declared in the case of Barker v. Moore & McCormack Co., 36 F. (2d) 104, nor did it entitle the charterer to an allowance or offset.

* * *

WHERE an installation of cribbing enlarging the structural capacity of a ship for carrying goods beyond what the ship could naturally and reasonably take was made by the charterer, the charterer was under the duty of exercising due care and skill to properly construct containers; and the charterer was not excused for its failure in those respects by the facts that the master did not object to the way in which the containers were built, and permitted the vessel to go to sea with them.—VIDARHOLM, 36 F. (2d) 227.

* * *

A STEAMSHIP going coastwise is not necessarily in coastwise trade within the immigration rules of March 1, 1927, providing for forfeiture of nonimmigrant status of foreign seamen entering such trade during period ashore allowed them by such rule. "Otherwise," said the court in the case of United States v. Day, 36 F. (2d) 278, "foreign vessels could not go, for example, from New York to Norfolk en route to foreign ports, as they commonly do." It was held in this case that a Chinese seaman acquitted of importing narcotics in violation of law had not abandoned his calling to become a drug smuggler so as to forfeit his nonimmigrant status during the 60-day period ashore allowed him by the immigration rules.

* * *

EVIDENCE in the case of Cheek Neal Coffee Co. v. Osaka Shosen Kaisha, 36 F. (2d) 256, disclosed that coffee had been shipped under clean bills of lading, which recited that the shipment was in apparent good order and condition. Such recital, said the court, was not contractual and did not amount to a warranty as between the immediate parties and the carrier was free to prove the contrary.

* * *

THERE was no actionable wrong, it was held in the case of O'Bryant v. States Steamship Co., 36 F. (2d) 305, in the requirement of a ship's master that a seaman go to work or lose his pay after he had sustained injuries, it appearing that there was no physician on board, and the injuries were thought to have resulted from fight, and the injured seaman had previously been quarrelsome and insubordinate.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	585	2,722,344	559	2,596,692
May	592	2,697,642	643	2,955,826
April	558	2,662,532	574	2,601,047
March	546	2,490,027	562	2,470,228
February	508	2,280,543	512	2,272,393
January	542	2,506,444	572	2,658,125
December	517	2,331,342	518	2,257,424
November	520	2,236,677	537	2,387,932
October	564	2,591,207	561	2,561,403
September, 1929	577	2,642,897	567	2,548,764

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	92	240,323	72	169,627
May	105	271,618	64	143,167
April	89	236,257	63	177,289
March	96	285,754	58	190,093
February	86	248,417	67	194,809
January	94	281,558	66	202,453
December	87	237,510	49	143,761
November	80	222,026	48	133,872
October	99	262,305	62	154,401
September, 1929	107	282,105	61	145,895

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	152	325,325	110	222,555
May	163	362,849	114	274,019
April	105	298,347	76	203,497
March	85	271,423	57	193,317
February	87	281,012	44	159,767
January	93	306,097	42	128,581
December	95	286,749	62	208,978
November	101	332,269	67	221,318
October	95	310,386	56	196,590
September, 1929	139	387,061	106	265,839

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	39	70,119	34	60,536
May	31	46,797	33	52,619
April	17	47,308	20	52,313
February	26	71,155	21	57,834
January	27	72,734	26	71,929
December	22	47,329	23	51,644
November	26	51,231	26	50,475
October	25	54,402	25	56,022
September, 1929	30	58,497	30	64,559

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	6	26,588	4	18,640
May	7	28,953	6	23,794
April	10	44,564	6	24,407
March	7	31,668	5	23,382
February	12	44,382	7	28,774
January	13	48,880	5	24,055
December	10	35,615	4	16,406
November	10	38,203	6	22,371
October	6	20,741	8	32,974
September, 1929	9	38,226	5	23,339

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	31	122,569	48	175,167
May	32	122,714	49	179,845
April	.....	.....	.....	.....
March	26	103,710	44	159,420
February	31	123,100	47	185,192
January	31	122,031	44	165,208
December	39	146,486	53	118,117
November	34	129,809	65	234,575
October	39	148,172	59	221,007
September, 1929	33	129,576	52	191,302

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	153	486,645	157	481,837
May	152	457,169	150	463,958
April	166	502,204	179	529,912
March	141	438,638	139	433,168
February	139	432,422	142	431,664
January	131	422,932	135	435,506
December	134	415,201	134	425,362
November	132	438,274	137	446,120
October	138	450,603	146	463,723
September, 1929	117	374,893	108	355,532

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
May, 1930	28	58,214	53	131,768
April	14	35,914	61	178,792
February	21	47,835	59	180,510
January	13	27,927	75	208,959
December	30	75,636	58	164,287
November	39	50,600	79	204,216
October	32	87,466	79	209,997
September	27	67,040	74	189,010
August	32	86,983	95	256,104
July, 1929	32	74,562	97	220,215

Jacksonville

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	10	25,129	12	23,737
May	14	32,001	19	51,210
April	13	23,378	13	27,999
March	17	26,625	12	23,963
February	14	35,002	13	31,353
January	12	24,225	16	31,722
December	19	36,831	12	20,409
November	10	22,938	10	18,750
October	12	20,268	8	19,134
September, 1929	17	36,618	13	23,731

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	57	69,679	56	68,653
May	104	120,788	108	120,160
April	89	90,105	82	90,249
March	93	89,490	76	86,235
February	85	90,050	70	87,109
January	74	86,081	71	85,990
December	68	78,984	65	78,634
November	84	97,555	83	97,217
October	74	88,850	75	88,853
September, 1929	55	64,464	59	72,321

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	113	211,446	111	212,639
May	98	169,700	106	203,070
April	115	225,516	119	235,115
March	131	280,484	126	286,119
February	104	254,408	116	276,137
January	118	281,672	108	256,384
December	110	262,685	101	238,149
November	107	231,376	111	259,712
October	123	304,950	119	294,276
September, 1929	91	208,323	83	213,660

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	49	215,525	53	228,554
May	54	235,178	53	222,715
April	55	230,429	55	217,705
March	52	205,674	59	245,363
February	55	231,213	47	195,156
January	51	229,516	55	246,266
December	57	292,419	62	302,713
November	68	278,207	73	306,493
October	72	293,569	68	277,041
September, 1929	46	203,192	47	203,236

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	233	606,340	239	626,307
May	260	686,543	251	662,383
April	226	712,630	261	701,159
March	255	703,361	263	699,493
February	263	715,681	237	630,673
January	252	706,945	260	715,903
December	273	772,310	279	785,160
November	268	736,452	269	739,461
October	244	681,983	261	713,490
September, 1929	257	684,203	260	698,665

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net. tonnage	—Clearances— No. ships	Net tonnage
April, 1930	22	49,651	26	56,022
March	32	70,250	24	60,834
February	20	52,660	18	44,494
January	25	61,031	22	58,857
December	16	42,198	19	46,455
November	24	62,691	27	75,588
October	24	62,345	25	65,733
September	19	52,795	12	32,870
August	17	37,818	15	29,341
July, 1929	11	21,622	10	20,558

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	28	60,622	63	171,223
May	35	59,807	82	240,137
April	26	39,332	66	183,706
March	24	31,987	82	235,656
February	26	48,200	68	197,140
January	30	77,176	87	274,299
December	27	65,306	104	358,823
November	28	68,030	108	332,315
October	36	88,056	118	385,367
September, 1929	47	131,512	101	323,955

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	240	632,188	225	641,270
April	214	639,153	200	637,922
March	211	682,547	218	677,011
February	177	580,092	165	542,392
January	185	601,710	176	596,007
December	212	619,119	178	589,551
November	225	676,209	215	664,661
September	259	621,704	225	605,808
August, 1929	204	583,568	185	554,520

San Francisco

(Exclusive of Domestic)

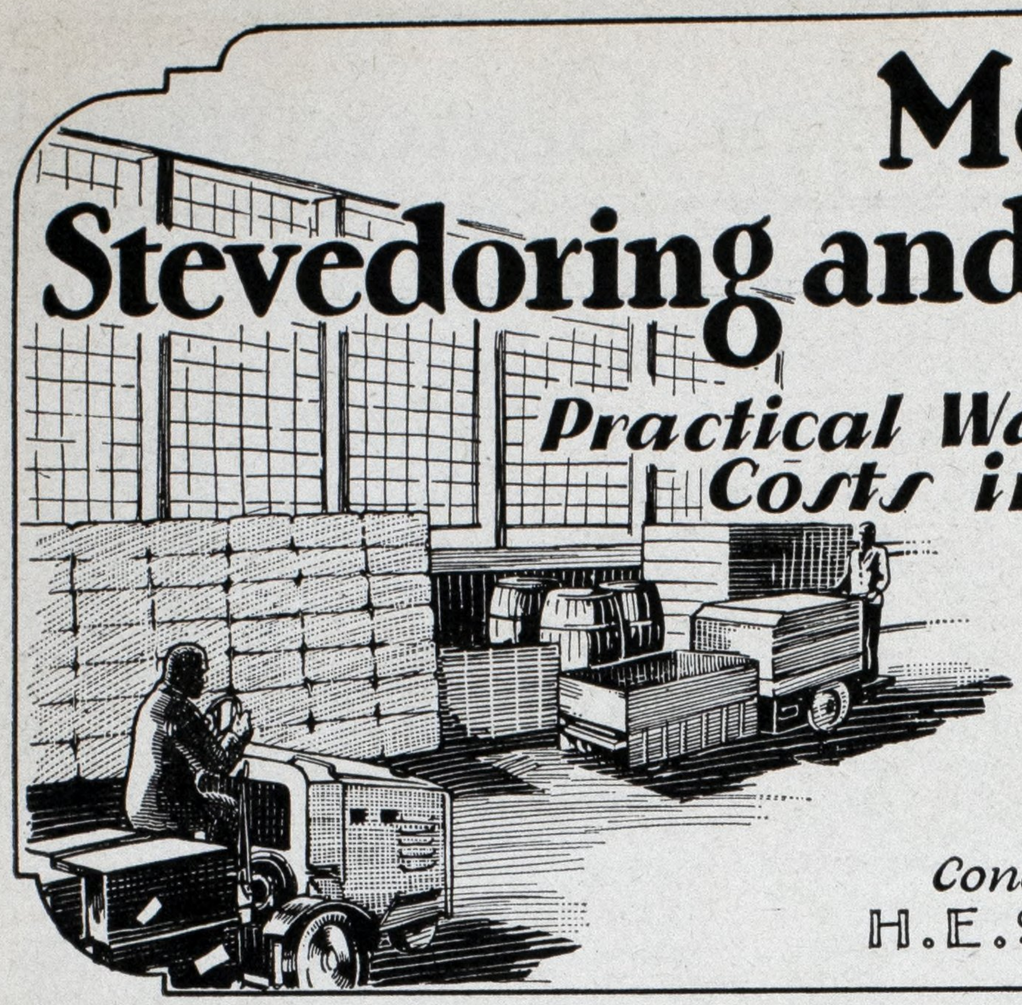
Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1930	154	652,411	134	560,605
May	168	709,182	156	625,712
April	161	555,903	156	569,368
March	179	710,763	150	631,782
February	142	565,514	135	567,268
January	158	644,015	149	630,336
December	182	632,677	148	558,136
November	161	620,878	143	579,803
October	179	696,620	164	667,367
September, 1929	151	563,770	134	559,772

Port Arthur

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
May, 1930	8	25,362	16	47,338
April	18	60,745	20	60,563
March	19	58,652	24	65,593
February	16	46,488	16	43,414
January	15	42,725	23	69,678
December	21	60,843	20	57,783
November	22	76,862	21	66,067
October	13	45,041	20	58,624
September	21	71,932	21	74,402
August, 1929	21	76,420	24	76,700

Note: The figures given in this table are for direct entrances and clearances. Additional vessels in foreign trade enter and clear from and to other American ports after original entry and before final departure. At the port of Philadelphia, for instance. additional vessels in the foreign trade in this category were 71 of 245,429 net tons entered and 68 of 220,271 net tons cleared for the month of June.



Modern Stevedoring and Dock Management

Practical Ways to Cut Costs in Cargo Handling



Conducted by
H. E. STOCKER

Waste Elimination Should Be Applied to Lower Cargo Handling Costs

By William B. Ferguson

THE now popular expression in industry, "elimination of waste" originated nearly ten years ago, when Herbert Hoover as the first president of the American Engineering council named fifteen prominent engineers as the "Committee on the Elimination of Waste in Industry." A five months' survey or analysis (or assay) of avoidable waste was made in six typical industries, with over 80 engineers or industrial managers engaged in the work. The writer and his staff assisted Fred J. Miller, past president of the American Society of Mechanical Engineers, in the survey of the metal trades' industry, in which we covered 16 plants, no two of which were alike.

The same "questionnaire" and method was used in all the industries surveyed, covering 115 plants. Since a similar survey might be made with profit in the shipping industry, or in a definite section thereof, such as cargo handling, it may be of interest to repeat the results or published findings in the six industries, published in book-form—"*Waste in Industry*" 1921, very briefly:

What Waste Investigation Showed

	Present waste Per Cent	Portion of waste due to management Per Cent
Men's Clothing Mfg.	65	75
Building Industry	53	65
Printing	58	63
Boot & Shoe Mfg.	41	73
Metal Trades	29	81
Textile Mfg.	49	50

Quoting from the Report: "The quantities above justify the following statement: Over 50 per cent of the responsibility for these wastes can be placed at the door of management and less than 25 per cent at the door of labor, while the amount chargeable to outside contacts is least of all."

The committee found that "Waste in industry" has four aspects, as follows:

1. Low production caused by faulty management of materials, plant, equipment and men.
2. Interrupted production, caused by idle men, idle materials, idle plants, idle equipment.
3. Restricted production intentionally caused by owners, management or labor.
4. Lost production caused by ill health, physical defects and industrial accidents.

After a lapse of nine years, these six industries have so improved in management that the "avoidable waste" estimated by the committee, which existed nine years ago has in many cases already been eliminated—proving that these estimates were quite low or conservative.

During the past three or four years, many companies and plants have conducted their own "waste elimination campaigns," in a well-planned, methodical manner—notably the Newport News Shipbuilding & Dry Dock Co. The Westinghouse Electric & Mfg. Co., plants of the United States Steel Corp., and of the General Motors Corp., and many others. These "campaigns" have shown unusual and remarkable savings in dollars—most of them starting with a survey of all the

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The author, William B. Ferguson, is a consulting engineer, New York, who has specialized in waste elimination and management.



Is There a Better Way? Possibly This Man Can Suggest It

elements of cost and an estimate of the possible savings—applying the analysis to every phase of the business. Materials handling offers a great field for improvement in any company, of any kind, in which a thorough analysis has not yet been made.

Cargo handling is material handling—with many phases of related functions, all of which have to be co-ordinated for real results in "waste elimination."

The main practical feature of these waste campaigns has been a simple and practical "suggestion system"—by which every employee was encouraged to make constructive or helpful suggestions, without fear of "getting in bad" with his superiors—and prizes were offered for the most valuable suggestions.

The great possibilities of eliminating waste in any industry or company by a well developed plan or campaign are illustrated by the concrete savings of the companies who have actually tried it out—including the companies mentioned above, whose savings already made were reported as follows: (Quoting from the "Elimination of Waste committee" of the American Society of Mechanical Engineers"):

Newport News Shipbuilding & Dry Dock Co.

"An estimate of the annual saving which will result from this first campaign against waste amounts to well over $250,000."

Oakland Motor Car Co. (Division of General Motors Corp.)

"From suggestions which lent themselves to our immediate uses, the savings represented were in the sum of $542,000 covering nearly a yearly period of operation. From those which were held for later application a like value was estimated at their actual worth, assuring us of a net profit on the expense and effort involved in the campaign of $1,000,000."

Westinghouse Electric & Mfg. Co.

"We have estimated that in our organization where, notwithstanding the fact that a very great deal of attention has for years been given to the subject of waste elimination and prevention, an annual campaign is worth at least $50,000 to us."

United States Steel Corp.

This report lists *three* suggestions by its subsidiaries that show an annual saving of $16,750 and adds:

"It would be next to impossible to measure in money the savings that will result from the acceptance and operation of the suggestions that give promise of saving money, but this saving, great as it might be, would very likely be less than the intangible benefits resulting from the increased inquiry, efficiency, carefulness, and loyalty which the campaign introduced."

Now how could such a survey and campaign be made for shipping companies—or even for the one phase of the business "cargo handling," which is the largest item or group of operating expenses? First we would "break down" the outgo dollar, or express each of the main cost elements as a per cent of the total expenses; then take a look at each one separately, breaking each one into further sub-divisions. Then see which elements seem to be too high—after observations in detail and comparisons with what has been done elsewhere, or with what seems possible to do.



Handling Rolls of Paper with Special Type of Truck

For example: Instead of taking a simple cargo vessel, let us take a hypothetical case or sample of a fleet of combined cargo and passenger vessels, just to illustrate how much we spend for cargo handling, compared to the other usual operating expenses; the figures used are not actual figures but you can put down the actual figures for your own company as shown in table below.

Now let us break down cargo handling costs, cost group 1, into its main elements, and include a transfer of the charges under other cost groups which are *incident* to cargo handling. Estimated savings are from better management and reduced cost-per-ton.

A 20 per cent savings in cargo-handling means (in this hypothetical

A Breakdown of Ship Operating Expenses

	Item of Expense	Expense Per Annum	Per cent of Total	Savings Remarks
1.	Gargo Handling	$ 3,000,000	30	Biggest chance here.
2.	Wages of Crews & Officers	1,600,000	16	Chances limited.
3.	Fuel	1,300,000	13	Good chances.
4.	Repairs & Maintenance	400,000	4	Limited chances.
5.	Stores	200,000	2	Limited chances.
6.	Commissary	200,000	2	Limited chances.
7.	Port dues, etc.	400,000	4	Largely fixed.
8.	Canal Tolls	700,000	7	Largely fixed.
9.	Cargo Insurance, Claims	200,000	2	Big chance here.
10.	Other Insurance	300,000	3	Good chance here.
11.	Taxes, Depreciation, etc.	600.000	6	Fixed charges.
12.	Other General Overhead Expenses	1,100,000	11	Good chance
	Total	$10,000,000	100%	



Tractors and Trailers in Use on a New York Pier

case) a 7 per cent savings in total operating costs—or an increased profit of about 7 to 8 per cent on either the capital invested or the "net worth." This has an effect on the

Estimated Savings—Better Operation

Cost Group	Expense item	Annual Dollars expense	Est'd. % Savings possible	Estimated possible sav. in dollars
1-(a)	Stevedore labor (1) Straight time	$1,000,000	20	$200,000
	(2) Overtime	700,000	30	210,000
(b)	Pay of Dock force (piers and terminals)	500,000	10	50,000
(c)	Other Cargo-handling expenses	500,000	20	10,000
(d)	Insurance (cargo); P. & I.; Claims	200,000	40	80,000
(e)	Insurance Stevedores; injuries; claims	200,000	40	80,000
(f)	Other accidents or damage, costs	100,000	30	30,000
(g)	Miscellaneous expenses	100,000	30	30,000
	Total cargo handling costs	$3,500,000	20	$690,000

the men right on the job—both supervisors and workers.

For example: This section of MARINE REVIEW in the past two years has described many concrete cases of actual net savings in cargo-handling. One case shows an improvement of 15 per cent in stevedoring costs due to the use of tractors and trailers and improved supervision.

Another case shows an improvement of 50 per cent.

Another case, where "skid interchange" methods were developed and installed, shows a great savings. How can unnecessary congestion at piers—with so many trucks lined up and waiting—be eliminated?

Of course, every pier is different—ships are different—cargoes are different—conditions are all different—but there is a method or technique of getting at the solution definitely, concretely, as outlined briefly above, that will disclose and reveal all the local details and is bound to result in some elimination of existing waste, and to improve "net profits." The hypothetical case given above, according to the views of many experienced operators and competent observers connected with shipping, is not so far off for the average shipping company which has not yet had the time or talent to make a thorough study—and to make it "with an open mind." The best methods in any industry five years ago are not good enough today; the best today will not be good enough five years from now.

finances of the company (as can be shown graphically) equivalent to increasing the revenue or cargoes carried (sales) by about 20 per cent. This is worth thinking about very seriously.

Any shipping company whose main revenue is from cargo handling or freight, in planning a combined "survey of waste and waste elimination" program or campaign along the lines so successfully used in other industries, would first list up a number of "thought-provoking" topics for its executives and employees to make useful suggestions about—including:

1. Is the type of organization satisfactory?
2. Do you have the authority that should go with your responsibility?
3. Any improvements suggested as to quicker and better ways of doing your particular job?
4. Is our record for loading and discharging cargo up to expectations? How many "tons per hatch hour" would be a reasonable performance? Are our facilities o.k.—as winches, booms, etc.?
5. Can we use skids or tractors and trailers, or lift-trucks, or conveyors or special slings and other equipment to reduce our cost-per-ton?
6. Are the pier floors and ship's decks designed and built for the use of trucks and tractors?
7. Is our cost system satisfactory? Do the responsible supervisors get *prompt* figures of cost; and in such form that they can say "This figure is too high—I will improve it?"
8. Are our insurance rates too high? How can we reduce them, through making better records as to "damaged cargo?"
9. Do we classify and follow-up the complaints of shippers and consignees? How can we secure better co-operation and good will?
10. Are our training methods satisfactory?
11. Do we reward unusually good results?

A hundred other "thought-provoking" questions could be asked, and you will get a lot of good ideas from

THE shipping industry is peculiar. It is difficult to standardize. It probably can't be standardized. Nothing can well be more variable, from the captain on the bridge to the size of freight packages. This great industry has grown largely by rule of thumb methods; particularly so in the United States in spite of the fact that in no other country has the planner and the engineer been so ingenious in developing low cost methods of production. Even Henry Ford in going into shipping was hampered by tradition and custom. The engineer has contributed the limit of his skill in building marvelous modern ships with greater speed, greater fuel economy, far greater maneuverability and of a convenience and luxury not dreamed of but a few years ago. Why shouldn't the engineer study and analyze every department of the steamship business with the view of eliminating waste. Individual managers here and there put vigor, efficiency into their business and it is men of this type who are now considering a systematic, thorough survey of all operations with the view of reducing costs.

Mobile Oceanic Line Sold

The shipping board on July 16 approved the recommendation of the Merchant Fleet Corp. that the Mobile Oceanic line be sold to the Waterman Steamship Co., Mobile, Ala., for $9 a deadweight ton. The Waterman company is the managing operator of the service. The total price to be paid for the line, which involves 14 vessels, will be $1,074,330, and this will be paid on the basis of 25 per cent down and the balance over a period of seven and one-half years, bearing interest at 4¼ per cent.

Under the terms of the offer Waterman Steamship Corp. agrees to operate the 14 vessels between the port of Mobile, with the privilege of calling at Pensacola and Gulfport and other East Gulf ports within the Key West and Gulfport range, to the United Kingdom, Ireland and Continental Europe (Bordeaux and north) with the further privilege of carrying cargoes from Mexican and Cuban ports to the United Kingdom, Continental Europe, Bordeaux and north; also the privilege of carrying westbound cargoes from the United Kingdom, Continental Europe, Bordeaux and north to the North Coast of South America, Central America, Mexico, Cuba and other islands of the West Indies; also cargoes from the West Indies to ports within Gulfport-Tampa Range.

The offer stipulates that the service will be guaranteed for a period of five years and that the purchaser will make not less than 52 outward voyages per annum of which not less than two of such voyages shall be made in each and every month, the vessels now operating to be delivered upon completion of their present voyages at ports of discharge.

Why Is Stevedoring So Hazardous?

Personal Injury Experience in Cargo Handling Operations on the Pacific Coast—Losses Are Reduced

By Byron O. Pickard

THAT handling ship cargo is considered a relatively hazardous occupation, when compared to injury frequency for men handling materials in other industries, is well demonstrated by a comparative study of "manual" or "base" premium rates for insurance protection on industrial injury experiences.

In California, the 1930 compensation insurance manual premium rate based on each one hundred dollars of payroll for stevedores working aboard ship is $11.11; for stevedores on the dock $6:65; and for talleymen and checking clerks $1.59. These rates are among the highest base rates charged any industry in the state.

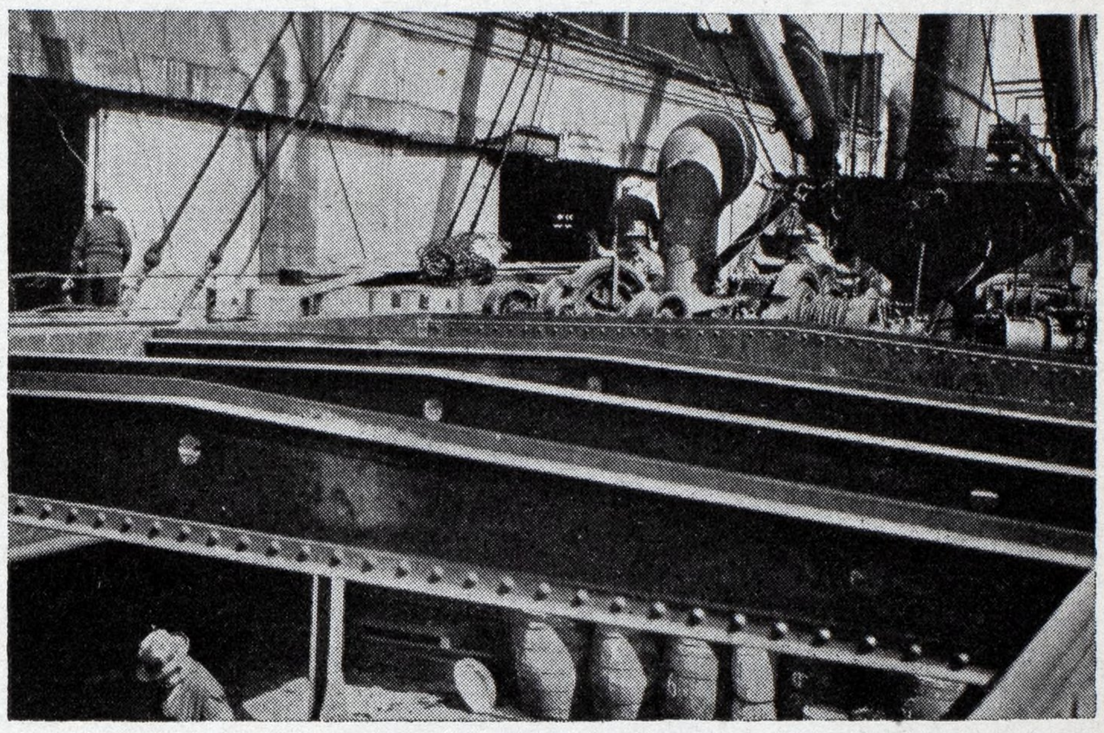
It is believed, however, that through the results being obtained from an intensive safety campaign carried on in several of the principal ports on the Pacific coast, that the hazards are gradually being understood and longshore injury experience will be no greater eventually than that for handling materials in any industry.

In 1927 the personal injury experience for San Francisco bay longshoremen was 160 lost-time injuries for each million tons of cargo handled. In 1929 the San Francisco bay cargo handlers averaged 90 lost-time injuries for each million tons of cargo handled. This indicates a frequency reduction of more than 40 per cent and a saving of many severe injuries in 1928 and 1929.

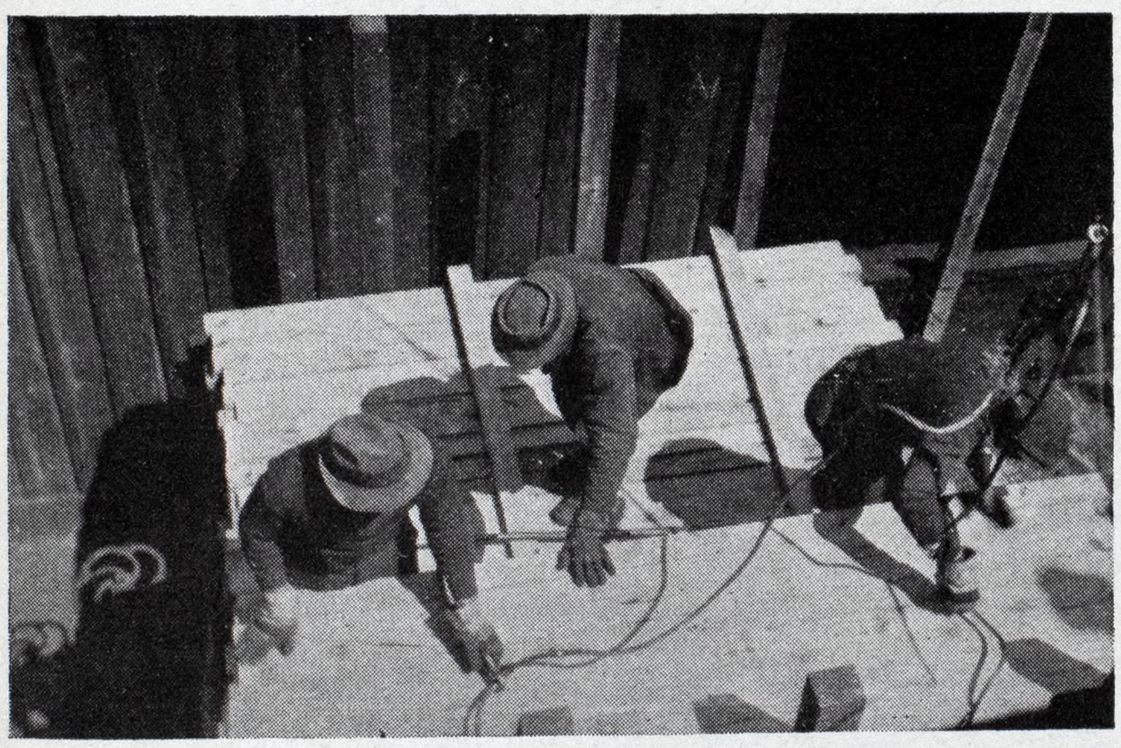
During the same year (1929) a study was made, based on man-hours worked and the complete records from nine representative companies were obtained covering individual company experiences in Los Angeles, Portland and San Francisco. These nine companies reported a total of 3,675,000 man-hours worked during the year with an experience of 806 lost-time injuries and 48,121 lost days.

The average "frequency" rating for these nine companies was 219 lost-time injuries for each million man-hours worked. The lowest "frequency" rating reported by any one company in the group was 141 lost-time injuries per each million man-hours worked, or an approximate average of 1.4 major injuries per day for each 1000 men. The highest "frequency" rating in the group was 339 lost-time injuries for each 1,000,000 man-hours worked or 3.4 injuries per day for each 1000 men.

The "severity" rating for the nine companies was 13.09 lost-time days for each 1000 man-hours worked; each lost-time injury averaged a loss of time of seven weeks; (there were three fatalities which were computed at 6000 days each; permanent partial disabilities were rated at the standard scale used by compensation boards); also it may be reasoned from this figure (assuming that 1000 man-hours represents 100 men working one 10-hour day) that for every 100 men employed as stevedores, there are thirteen off duty on account of accidents.



Strongbacks Should Have Flange Four Inches Wide for Supporting Hatch Covers



Safety Engineering Pays When Handling This Class of Cargo

The lowest company "severity" rating reported from the group was 6.75 days lost for each 1000 man-hours worked, whereas the highest severity rating for the year was nearly four times as great being 26.27 days lost for each 1000 man-hours worked.

One of the San Francisco companies gave the writer an opportunity to compute "gang" frequency ratings for the year for each of fifteen regular longshore gangs. The "gang" method is universally used in San Francisco. Each gang consists of 16 to 20 men for each hatch under the leadership of a "gang-boss." These gangs are well organized units with the personnel of each gang remaining practically constant and in some companies, especially the one being discussed, there is sufficient work to justify the gangs being regularly and continually employed. It was found in this study that the "gang" frequency ratings varied from 35 lost-time injuries for each million man-hours worked to 285 lost-time injuries for each million man-hours worked. Seven of the gangs were above the company's average; eight were below the company's average four of the gangs ran a close race for first place; whereas four others were excessively high. The so-called "extra" gangs

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Modern Mechanical Cargo Handling Equipment Helps to Reduce Chance of Accident

that were necessary throughout the year were grouped together and it was found that their combined "frequency" rating was 170 lost-time injuries for each million man-hours worked, which rating is considerably lower than five of the regular gangs employed and higher than ten other regular gangs.

The cost of stevedoring accidents is always of interest but it is rather hazardous to attempt to arrive at any large exposure over a considerable factor without having available a period. During 1929 two large San Francisco stevedoring companies, that have assumed their own personal injury risk, favored the writer with complete costs for medical, hospital and compensation. All cases that were not closed at the end of the year were carefully estimated and the estimates included in the totals. One of these companies reported a total of 76 lost-time injuries with a total cost for medical, hospital and compensation expenses for the year of $16,400.00. The second company experienced 67 lost-time injuries with a total of $17,200.00; making a total of 143 lost-time injuries with a total cost of medical hospital and compensation of $33,600.00 or an average of better than $225.00 per each lost-time injury. It will be agreed that the medical, hospital and compensation costs are only accident to an employer. The total cost is reasonably estimated for stevedoring as three times the cost of medical, hospital and compensation (known in insurance parlance as "pure premium"). This factor of three includes the loading factor charged by insurance companies to do business and the so-called "hidden-costs" of injuries, including delays, wastage through loss of cargo, leakage of gear. inefficient practices, etc. It also includes accidents that do not result in injury, but cause loss of time in production.

It can be conservatively concluded from the above companies' experiences that each lost time injury represents an average cost to a San Francisco stevedoring employer of more than $500. In ports where an accident prevention program is not actively and sincerely carried on the average cost per injury may be as high as $1000.

It has been mentioned casually herein and should be stressed that accidents not only cause injuries to workmen, but injuries to cargo handling gear, to cargo itself, to docks and to ships, and result not only in the wastage of human bodies and of human efforts, but also in the wastage of costly material such as cargo, expensive gear, expensive equipment and the like. Pilferage of cargo is an economic loss which can also be indirectly attributed to accidents. Delays are always the result of accident.

Little has been mentioned in the foregoing relative to the economic loss, to industry and to society at large, due to fatalities and permanent disabilities, and in a lesser degree, to temporary disabilities of workmen. However, this loss is indirectly a very proper charge to be made against an industry. Whether or not it is a proper charge to make against an individual operator may be debated.

It is a poorly directed safety program that adds to an employer's overhead or slows up production. There are but few instances on record which indicate that safety does not save money and pay dividends. It was stated recently by the manager of a large stevedoring firm on the Pacific coast that his profits were what he saved by prevention of "accidents" and he meant "accidents," not necessarily injuries, for he has learned that injuries represent only a portion of the cost due to wastage of time, material and labor resulting from industrial accidents.

Frequency and Severity Report on Loss-Time Injuries for Nine Pacific Coast Stevedoring Companies—1929

	A Lost-time Injuries	B Days Lost	C Man-hours Worked	Frequency	Severity
No. 1	113	3,999	592,039.25	191	6.75
No. 2	23	1,017	122,791.00	187	8.28
No. 3	67	9,878	376,059.00	178	26.27
No. 4	78	4,600	553,384.00	141	8.31
No. 5	103	8,750	507,780.50	202	17.23
No. 6	96	3,047	299,125.50	321	10.19
No. 7	76	2,690	227,604.50	334	11.82
No. 8	125	5,026	626,873.00	199	8.02
No. 9	125	9,114	369,077.00	339	24.69
Grand Totals	**806**	**48,121**	**3,674,733.75**	**219**	**13.09**

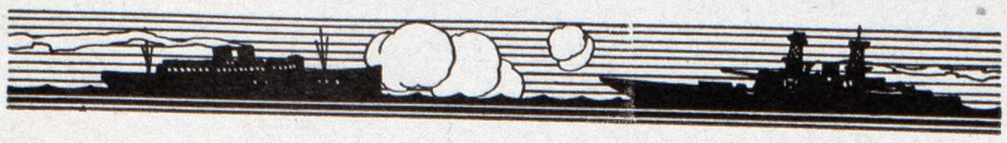
Note: (a) Frequency is based on the number of lost-time injuries, per 1,000,000 man-hours worked (1,000,000 x column A divided by column C).

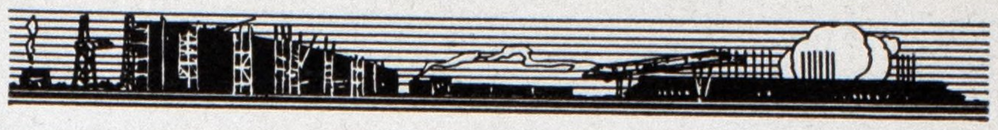
(b) Severity is based on the number of lost-time days, per 1000 man-hours worked (1000 x column B divided by column C).



A Broken Rail Is Unsafe and Should Not be Allowed to Remain in This Condition

Useful Hints on Cargo Handling





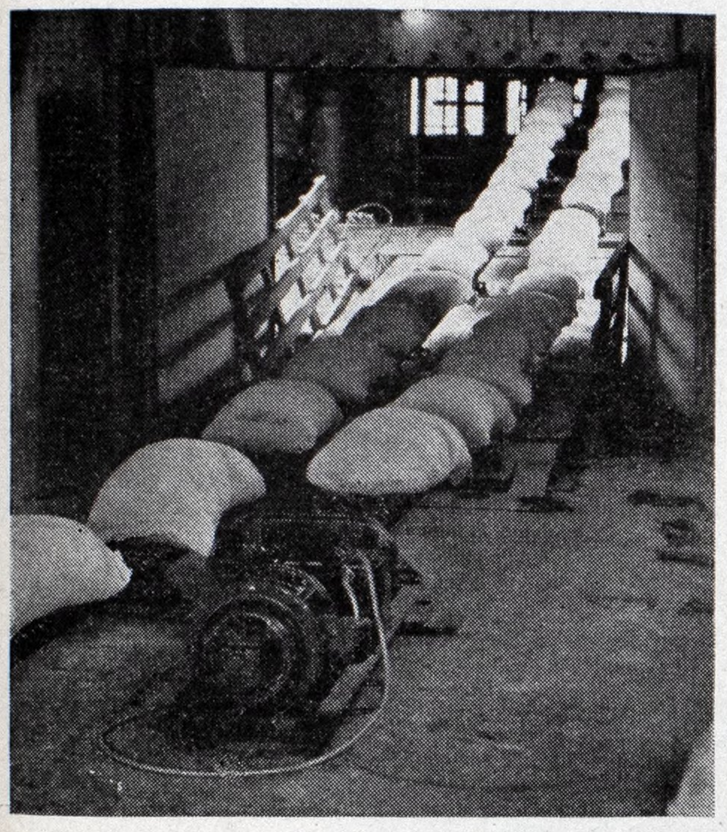
THIS page is to be devoted to short items on all matters having to do with the more efficient turn-around of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.

A GOOD rule to follow: Keep the checker on the lighter when handling general cargo. He should *not* be allowed to stand on ship's deck.

Cost of discharging bales of cork has been reduced by using a sling fitted with fifteen hooks. These are hooked to strap around the bales and the bales are then hoisted from stowage. Some hooks break loose but an average of twelve bales is handled in each sling load.

The Grace line uses steel sheets to protect hatch covers when discharging copper ingots. These are bent



Screw Conveyor Unloading Cargo of Flour

over on one end so they will hold to the hatch coaming as the draft is dragged into the square of the hatch. These sheets are a safety feature protecting men from falling.

Better Checking Methods

CHECKING of cigarettes has been simplified and made more accurate by the following method at the Eastern Steamship Co., Pier 26, New York. Instead of checking from the freight bills, tally sheets are made up showing serial number of packages in numerical order and with a column on the far right hand side for the tier check. When checker starts to check he counts the packages in the tier and places check marks in the far right hand column. Then as packages are loaded into transfer trucks for movement to railroad, he checks the tier package by package. This gives a double check and checking is speeded because it is far quicker to pick out the serial number on one or two sheets than on a large number of freight bills.

The Eastern Steamship Co. has arranged for a lot number after the consignee's name on each package. Then if the clerk who types the freight bill writes nine packages instead of 8, the number on the bill will not correspond to the number on the package and the error will be quickly detected.

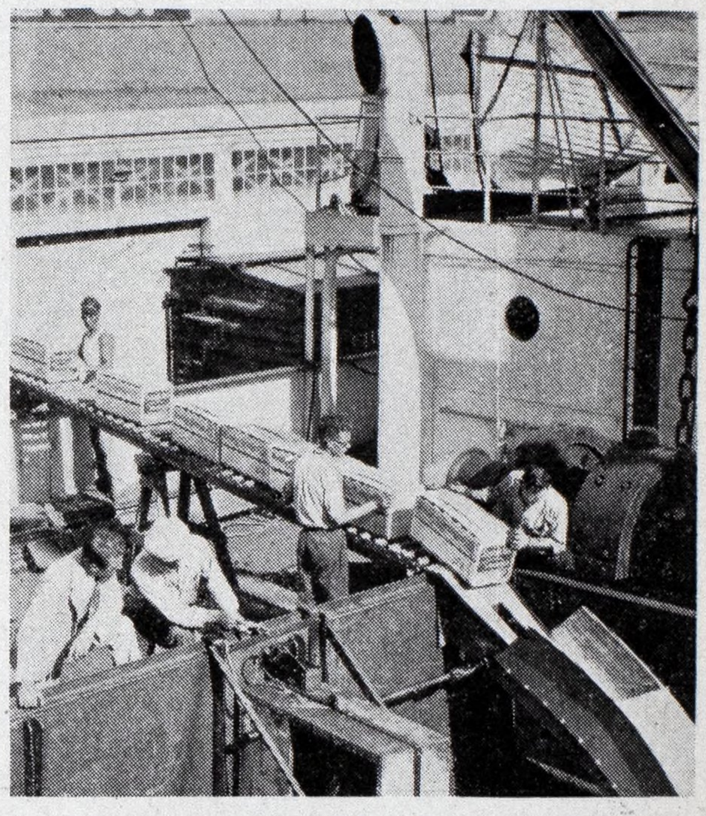
By loading trucks at night overs and shorts are discovered before trucks have started to the connecting railroad, reducing claims, time and effort necessary to handle over and shorts if action is not taken until deliveries have been made.

Loading with Conveyors

GRAVITY and power conveyors are used by the Banning company, Los Angeles stevedores, to load fruit.

Cars are placed on tracks running parallel with the ship. A gravity conveyor with a removable section running directly into the car is placed permanently at the point next to the doorway and cars are switched to this point with little loss of time. This gravity conveyor gradually conveys the cases up the side of the ship. From the power conveyor the cases are deposited on another gravity conveyor running on a gentle grade to the hatch coaming. At the hatch coaming they are deposited on a power conveyor which lowers them to depths regulated by the angle of the conveyor.

At the bottom of the power conveyors in the hold, a steel chute about 36 inches long and curved, changes the cases in a slight arc from about 35 degrees to a horizontal position where they are picked up by gravity rollers. This action does not allow the least fall or shock in handling the cases and at no time

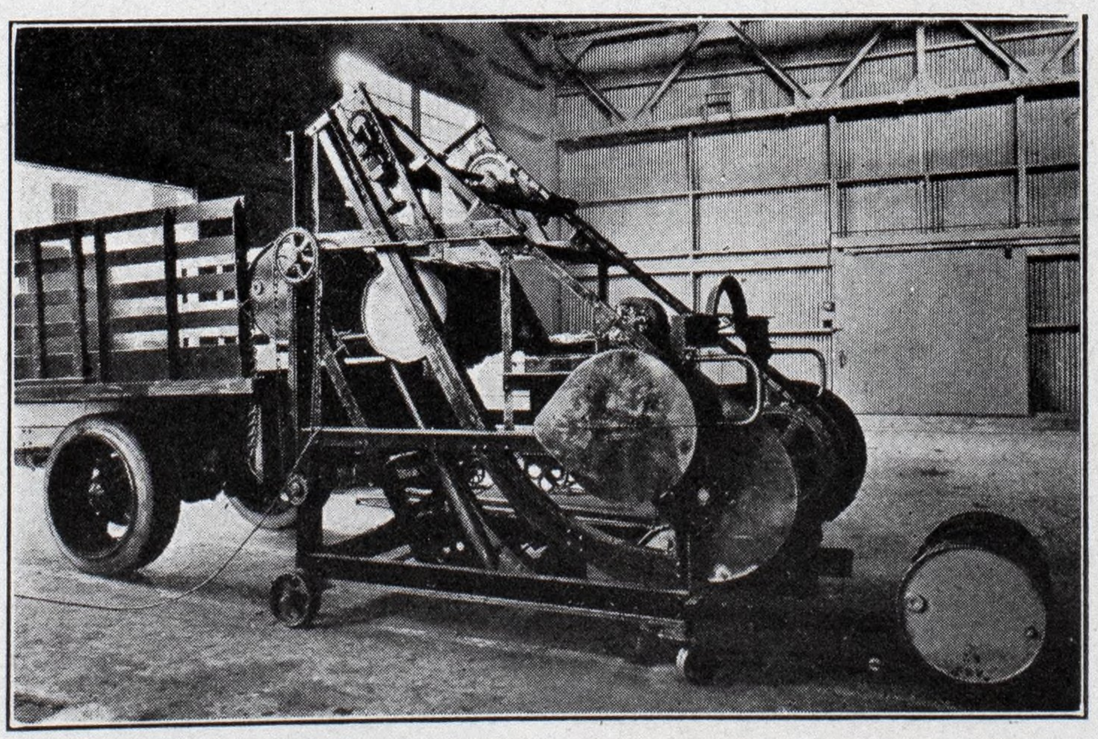


Using Conveyor for Loading Fruit

from the point of leaving the car until they reach the point of stowage are they lifted from the conveyors. The speed of the power conveyors is 100 feet per minute.

Quick Lumber Discharge

THE NACIREMA OPERATING CO. recently discharged 2,150,000 board feet of Pacific coast lumber at an average rate of 18,300 feet per hatch hour from an ordinary British tramp at its Port Newark terminal. There were two booms and two winches at hatches 1, 2, 4 and 5 but only one boom and one winch at number 3 hatch. The ship carried an average two inch dimension lumber cargo equally distributed in five hatches. Thirty-eight cars were loaded from ship's tackle which made the work slower than if all the cargo had been discharged to the dock. Ross carriers were used to take the drafts away from ship's side as they were unloaded.



Portable Loader for Lifting Barrels and Drums from Floor to Motor Trucks or Cars on Surface Tracks

Personal Sketches of Marine Men

George H. Bates, Vice President, United Dry Docks, Inc.

By B. K. Price



SINCE graduating from Stevens Institute of Technology, thirty-two years ago, he has been actively connected with shipbuilding and ship repairs in New York harbor.

WITH thorough technical training in marine engineering as a background, he is now in charge of the shipbuilding and ship repair activities of over 4000 men.

THROUGH many years of practical experience he is equally versed in the accounting and financial features of the business and is also company comptroller.

BACK in the fall of 1897 there was a wiry 125-pound end on the football team at Stevens Institute of Technology. He played in an era of bone-crushing football, of heft and mass formation plays, yet this diminutive end was a star. He was captain of his team.

In the 33 years that have since elapsed the ability and energy which made this young end a star have carried him to a position of prominence in his chosen field, the shipbuilding industry. Today, George H. Bates, for that is his name, is vice president of United Dry Docks Inc., New York city, in charge of production, with more than 4000 men under his direction. In addition, he is company comptroller.

He was born in Hackensack, N. J., Aug. 22, 1877. Shortly after, his family moved to Cranford, N. J., where he attended the public schools. He was graduated from Stevens Institute of Technology in 1898, with a degree in mechanical engineering.

That same year he became affiliated with the Staten Island Shipbuilding Co., now a unit of the United Dry Docks Inc., an affiliation that he has maintained now for 32 years. He began as draftsman, to be made chief draftsman the following year. He later became general manager and in 1907 was also appointed secretary and treasurer, holding all three positions at the time of the Staten Island company's absorption last year by United Dry Docks Inc.

In his capacity as engineer, he has designed the machinery for many a famous craft, including the 262-foot yacht NORMA, originally built for W. B. Leeds, and later owned by Vincent Astor. This boat was powered by twin, 4-cylinder triple expansion engines and developed a speed of 19½ knots. He also, in 1903, attracted considerable attention, when he developed a type of ram steam steering apparatus for harbor boats, to supplant the rather unsatisfactory rotary type then in use. It was designed with special valve and controlling gear, and it is interesting to note that this apparatus, without change or modification, has been in general use on New York harbor vessels ever since.

Mr. Bates' ingenuity has found expression upon many occasions. This year, on the repair of the LEVIATHAN, his company was confronted with what appeared to be an especially difficult task. To meet this emergency, Mr. Bates developed a new type of hydraulic riveter—known now as the strongback bull type. It was the only way the rivets could be driven hydraulically. An article describing this ingenious method appeared in the June number of MARINE REVIEW.

As vice president, he has supervision of work at the company's five yards, comprising the Crane, Fletcher, Shewan, Morse and Staten Island properties, all in the New York metropolitan district and also of production at the company's newly acquired yacht basin in Brooklyn—acquired from the Briggs Engineering Co. Four of these yards are devoted exclusively to repair work, while the fifth, the Staten Island yard, also does shipbuilding as well. The five yards have 25 drydocks, with the largest 685 feet in length and capable of handling a 27,000-ton vessel.

Mr. Bates recently completed the erection of a 60 x 400-foot tank shop at the Staten Island yard, which in addition to welded and riveted tank work is also being devoted to special structural fabrication. He also was in charge of the erection of the foundry at the Staten Island yard, a foundry capable of handling iron castings up to 30 tons and brass castings up to one ton.

Active in association work, Mr. Bates is president of the New York and New Jersey Dry Dock association and is a director of the National Council of American Shipbuilders. He is a member of the Society of Naval Architects and Marine Engineers and the American Society of Mechanical Engineers.

Veteran Great Lakes Shipbuilder Dies

Archie C. Payton, 64, for many years general superintendent of the Lorain and Cleveland yards of the American Ship Building Co. and recognized as one of the leading shipbuilding authorities in the country, died at his home in Lorain, O. on July 9, after a lingering illness. His health began to fail last October and on April 15 he retired from active business.

Mr. Payton was born in Dumbarton, Scotland, April 9, 1866 and served his apprenticeship in various shipyards on the Clyde, coming to America at the age of 19. He worked in the Wyandotte and later Cleveland yards of the American Ship Building Co., but left the Great Lakes district and went to Cramp's shipyard, Philadelphia. When the Lorain yard was established in 1898, Mr. Payton joined the staff and five years later was made assistant superintendent, becoming general superintendent in 1913. Serving in this capacity until 1923, he passed through the busiest period in the company's history, as the number of vessels built during the war at the Lorain yard for the United States shipping board was a large one.



A. C. PAYTON

In 1923 Mr. Payton was appointed general superintendent of the Cleveland yard, which position he held until about a year ago, when he retired. About 40 years of his life were spent in the service of the American Ship Building Co. during which time he supervised the construction of about 370 vessels of all types. His last work was for the Channel Steel Hull Corp. and the Cleveland Stevedore Co. supervising the reconstruction of the Steamer C. O. JENKINS in which the new system of welded channel tank top was being installed.

Although a leader in charitable and benevolent enterprises in the community in which he lived, Mr. Payton shunned publicity and had never been active in civic or political life. He is survived by his widow and one sister and two brothers.

To Operate Lines on Lump Sum Basis

The shipping board on June 21 authorized the Merchant Fleet Corp. to enter into new agreements with the managing operators of the Yankee and Oriole lines on a lump sum basis. The Consolidated Navigation Co. of Baltimore will continue the operation of the Oriole lines on the basis of a lump sum payment of $9,000 per voyage, the operator to assume all repairs up to $2,250 per voyage. Rogers & Webb Boston, will continue the operation of the Yankee line on the basis of a lump sum payment of $1300 per voyage, the operator to assume repairs up to $2,000 per voyage.

In putting these new operating agreements into effect it is anticipated that substantial reductions in the cost of operating the lines will be effected. The loss to the Fleet Corporation in the operation of the Oriole line during the first eleven months of the fiscal year 1930 amounted to about $1,300,000, an average loss of about $14,500 per voyage. Under the new arrangement the operator will curtail the annual number of voyages by about 25 per cent so that the total cost to the Fleet Corporation will amount to $675,000 besides what repairing expense the Corporation may be obliged to pay. In the case of the Yankee line it is anticipated that the annual cost of operation to the Fleet Corporation will be reduced from about $700,000 to $312,000 plus the cost of necessary repairs. Thus under the two agreements nearly a million dollars' reduction in operating costs is possible.

One of the most valuable cargoes per ton ever carried by vessel on the Great Lakes arrived at Buffalo, July 11 on the Steamer GEORGE D. DIXON of the Great Lakes Transit Corp. fleet. This vessel transported a cargo from the upper lakes of 3100 tons valued at $765,000. This tonnage was made up chiefly of wool from Montana, dairy products and flour.

Bremen Completes First Year of Service

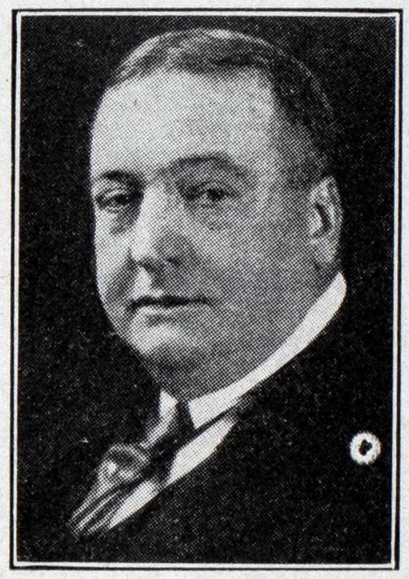
The North German Lloyd liner Bremen during the first year of her operation, recently completed, carried 54,153 passengers and covered 128,000 miles. Of these passengers 16,855 were carried in third class, the most popular part of the ship. The first class passengers numbered 15,123, tourist third class 12,379 and second class 9,796. Of the total of 54,153 passengers carried 26,587 were from Europe and 27,566 from the United States.

On her first trip to the United States, the Bremen made the crossing in 4 days, 17 hours and 42 minutes at an average speed of 27.83 knots, establishing a world record. On her return she improved this record, making the trip in 4 days, 14 hours and 30 minutes at an average of 27.91 knots. The fastest speed ever by the BREMEN was 29.5 knots.

Fruit Line Pioneer Dies at the Age of 62

William Newsome, senior vice president of the United Fruit Co., died July 1 at his home in Boston, in his sixty-second year. He is survived by his wife, a daughter and two grandchildren.

He was born in Jamaica Plains Boston. His first business venture was as super cargo for an English firm on the West coast of Africa. After two years of service on the Gold coast he returned to Boston and became a salesman for the Boston Fruit Co. He was identified with Andrew W. Preston and a small group of believers in the future of the banana when the United Fruit Co. was formed in 1899. For a time he was head salesman and later was transferred to Jamaica. In 1908 he was appointed manager of the West Indies department with headquarters in Boston and he was made a director in the Fruit Dispatch Co., the selling unit of the United Fruit Co. the same year, and a few months later a vice president. In 1924 he was made president of the Fruit Dispatch Co. resigning that office in Oct., 1925. In the United Fruit Co. Mr. Newsome was made director on Dec. 7, 1911, vice president in Dec. 1924 and senior vice president in 1924.



WM. NEWSOME

Expansion of the United Fruit Co.'s fleet and the building of new vessels occupied Mr. Newsome's attention in recent years. Two years ago he went to San Francisco to open the then new Pacific coast route. He has been an exponent of the building up of the American merchant marine ever since the matter received national attention. Friends said that Mr. Newsome was ship-minded and he handled the vessels of the United Fruit Co. in a manner that won him high praise in shipping circles.

Reports from four American shipbuilding companies receiving aid of loans from the shipping board's construction fund, indicate a substantial increase in employment in the yards. The board has been informed that these four companies—the Bethlehem Shipbuilding Corp., the Newport News Shipbuilding and Drydock Co., the New York Shipbuilding Co.—and the Sun Shipbuilding Co.—were employing 19,812 men on May 1, 1930, compared with 16,349 on July 1, 1929, a gain for the nine-month period of approximately 21 per cent.

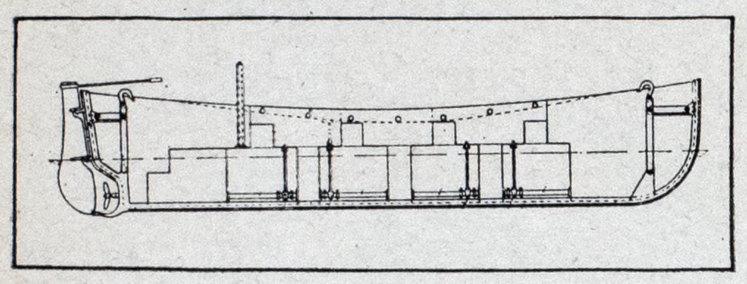
Patents Show Marine Development

Latest Marine Inventions Described

Specially Prepared for Marine Review
By Richards and Geier

Patent Attorneys, 274 Madison Avenue, New York

THE present invention relates to boats, especially to lifeboats, and an object of this invention is to provide a new method of constructing boats. Another object of this invention is to increase the air content of the boat and thereby the floating properties of the same by suitably constructing and arranging the seats.



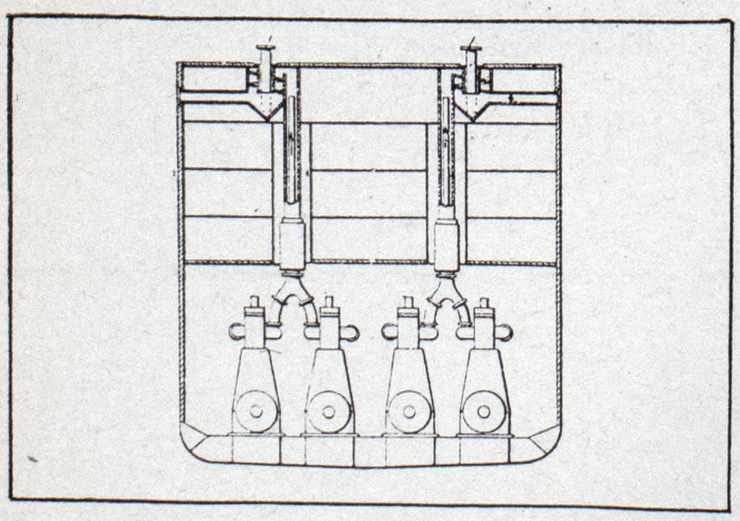
BOAT

United States patent No. 1,755,724, issued April 22, 1930 to Ernst Burmester, of Burg, near Bremen, and Hermann Hein, of Bremen, Germany.

THIS invention relates to steam or motor propelled ships provided with a deck to accommodate aeroplanes.

According to this invention means are provided for discharging the smoke or exhaust gases from the engine in a lateral direction below the level of the aeroplane deck more especially when the latter is to be used to receive or launch an airplane. Preferably the ship is provided with telescopic or like disappearing funnels which, when extended, enable the smoke or exhaust gases to be discharged in the usual manner.

The disappearing funnels are in some cases furnished with small openings to allow sufficient smoke or exhaust gases to escape in an upward direction through the airplane landing deck so as to indicate the direction of the wind.



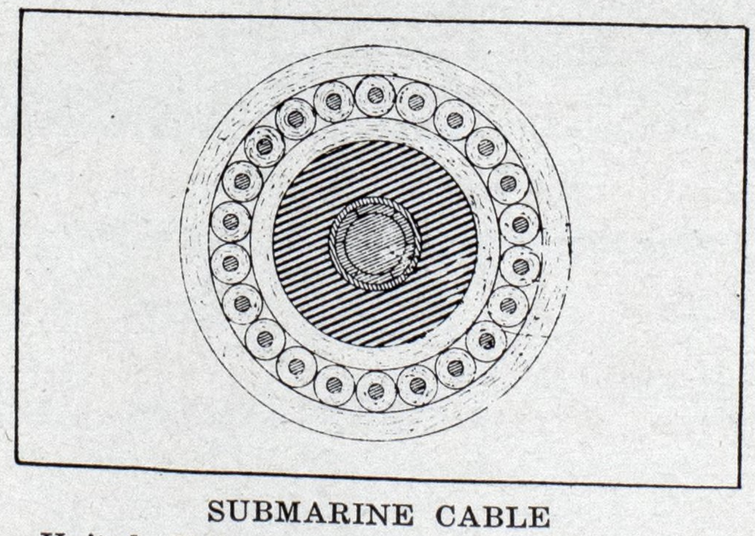
SHIP WITH AIRPLANE DECK

United States patent No. 1,757,770, issued May 6, 1930 to Wilhelm Hefti, of Winterthur, Switzerland.

WE HAVE made arrangements with the patent attorneys, Richards & Geier to publish data relating to letters patent issued in the United States covering inventions which may be of particular interest to our readers. The patents described, some of which have accompanying cuts partially illustrating the inventions, are all of recent date and we are planning, in subsequent issues, to publish similar information on patents pertaining to various phases of marine development work. Should our readers be interested in obtaining a printed copy of any of the patents appearing in this issue, or any other patent desired, such copies may be had by addressing request to the editor or direct to the contributors of this page.

THIS invention relates to submarine cables and more particularly to cables over which signals are transmitted involving a range of frequencies from zero to several hundred cycles per second.

An object of this invention is to diminish the sea return resistance of submarine cables, particularly for the range of frequencies just mentioned.



SUBMARINE CABLE

United States patent No. 1,756,546, issued April 29, 1930 to John J. Gilbert, of Port Washington, New York.

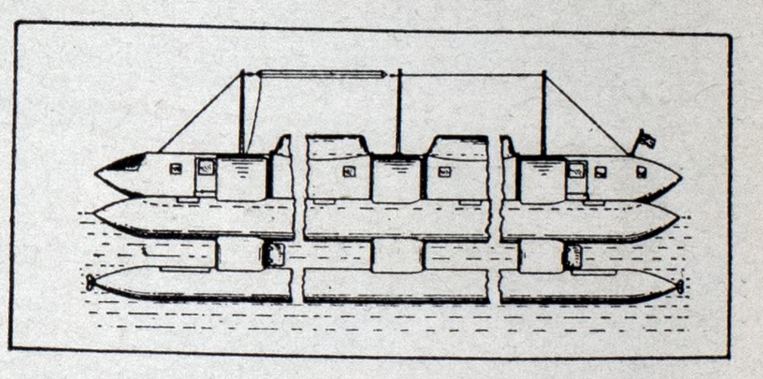
THE present invention relates to improvements in seagoing vessels, and an important object of the invention is to increase the speed by reducing resistance, to increase the efficiency in handling by permitting the vessel to turn within its own length and to be slid sideways with the use of rudders and propellers, and to increase stability in rough seas.

Another very important object of the invention resides in the provision of a vessel of this nature adapted to attain speed in ocean travel for freight or passenger purposes and capable of being used effectively in salvaging operation and particularly in salvaging of submarines.

A still further very important object of the invention resides in the provision of a vessel of this nature including a plurality of water line pontoons, a cabin pontoon, and power pontoons.

Another very important object of the invention resides in the provision of water type tubular members for interconnecting the pontoon.

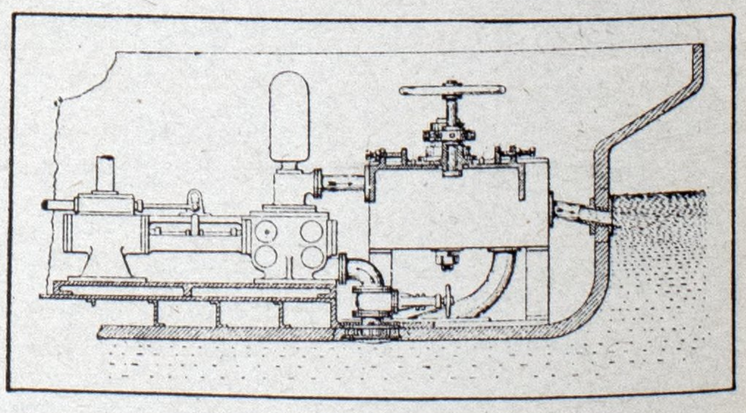
A still further very important object of the invention resides in the provision of a vessel of this nature which is strong and durable, thoroughly efficient and reliable for the purpose intended.



VESSEL

United States patent No. 1,757,174, issued May 6, 1930 to Homer C. Douglas, of Liberal, Kansas.

THIS invention relates to hydraulic ship propulsion, and the invention has for its general object to provide a novel assemblage of mechanism whereby to effectively direct a jet or stream rearwardly for the propelling of the ship forwardly or a jet or stream in a forward direction to reverse the vessel.



SHIP-PROPELLING MEANS

United States patent No. 1,758,847, issued May 13, 1930 to Amos C. McIntosh, of Eureka, Calif.

Work on Export Liners

(*Continued from Page* 40)

turbines with single reduction gears, driving a single propeller. Steam pressure of 325 pounds per square inch will be developed by four oil-fired water tube boilers with 150 degrees superheat.

Cargo and machinery space have been designed with a view to the special requirements of the Mediterranean trade. The vessels will have seven reserved for refrigerated cargo, for which there will be about 30,000 cubic feet of space.

Accommodations have been provided for about a hundred passengers above the shelter deck. The vessels will have the highest rating in the American Bureau of Shipping and will conform to the navy department requirements for naval auxiliaries. They were designed by Donald & Sharp. They are to cost between $2,500,000 and $3,000,000 each. The cost will be partly offset by the mail contract payment of $1,600,000 a year from the post office department.

New Coast Guard Boats

Thirty-four new coast guard picket boats, built for service against rum-runners, will be placed in operation on the Great Lakes by the end of September.

Contracts for these boats, authorized by congress upon a special request of President Hoover, have been let and all are now under construction, 22 at Benton Harbor and 12 at Brooklyn.

They are to be about 36 feet long, to bear no guns save the arms of their crews, and upon completion will take their place along with a large number of similar boats.

While these boats are in immediate prospect, another type whose design is being carefully guarded by the coast guard, is soon to be proposed for service. This new type is understood to be much larger, probably around 1500 tons, and is being designed to be used in trailing rum smugglers.

Plan New Coastal Ships

Two new express liners, costing between $3,000,000 and $4,000,000 each, are being planned by the Los Angeles Steamship Co. for operation between Los Angeles, San Diego and San Francisco.

The new ships will have accommodations for 500 passengers and space for about 1000 tons of cargo. Whether the new liners will be propelled by steam, diesel or electricity has not been announced, but it is specified that the liners shall be capable of making 24 knots.

Ralph J. Chandler, vice president and general manager of the Los Angeles Steamship Co. has announced that the company plans to build a $7,000,000 express liner for the Los Angeles-Honolulu run to take the place of the CITY OF HONOLULU, which was so badly damaged by fire on May 25.

Engineers Open Bids

Federal engineers of the Pittsburgh district opened bids July 28 for delivery afloat of one steel hull, whirler derrick boat with a capacity of 15 tons. The boat is to be 48 feet long, with a 40-foot beam and a depth of 5 feet, six inches, fully equipped with machinery. Liquidated damages for delay have been placed at $50 per day.

Bids for Aircraft Carrier

Bids from private shipyards for the construction of the aircraft carrier authorized in the program of last year, have been invited by the secretary of the navy, Charles Francis Adams. The bids will be opened at noon Aug. 12, according to a statement by the department of the navy:

The statement follows:

Bids for constructing aircraft carrier No. 4 have been advertised by Secretary of the Navy Charles Francis Adams, the closing date for receiving bids in the navy department being noon, Aug. 12, 1930.

Aircraft carrier No. 4 was authorized by act of Congress Feb. 13, 1929, which provided as follows:

"That the President of the United States is hereby authorized to undertake prior to July 1, 1931, the construction of 15 light cruisers and one aircraft carrier. * * *"

Appropriations for the new aircraft carrier totalling $600,000 in the current fiscal year, and for 1931, $3,450,000 is provided.

The new carrier will displace 13,800 tons. The SARATOGA, LEXINGTON and LANGLEY displace a total of 76,286 tons. Aircraft carrier tonnage allotted to the United States under the Washington treaty limiting naval armaments totals 135,000 tons.

Aircraft Carrier No. 4 will be the first aircraft carrier especially designed from the keel up for aircraft work in the fleet. The SARATOGA and LEXINGTON are converted battle cruisers and the LANGLEY, a converted collier.

Building Loan Awarded

Loans aggregating $4,661,220 to be used in aid of building two combination passenger-cargo steamers for the Eastern Steamship lines, one to be operated between Boston and St. John, New Brunswick, and the other between New York and Yarmouth, Nova Scotia, with the privilege of operating the ships in southern waters during the winter season, were authorized by the shipping board July 11. The ships will be built at the Newport News Shipbuilding and Drydock Co., Newport News.

The ships will be approximately 400 feet long, 60 feet beam by 18 feet draft and will have a displacement tonnage of approximately 6300. They will be equipped with geared turbines. Their construction will cost $3,214,500 for each.

Plan Sound Steamers

Colonial line has plans for two of the largest steamers ever operated on Long Island sound and would have put these vessels in commission long since had it not been for the policies of the New Haven railroad during the past three years, with the alleged purpose of destroying what little competition is left on the sound, Frank M. Dunbaugh, president of the Colonial Navigation Co., declared June 25.

Plan Two More Vessels

East Asiatic Co., according to advices from the West, is planning two more combination passenger and cargo vessels in addition to the new AMERIKA and the CANADA, which are to enter the Pacific-Europe trade this fall. The new vessels will have accommodations for 125 passengers and will be completed inside of a year. The AMERIKA and CANADA have accommodations for 52 passengers each.

Equipment Ordered

An order for propelling and condensing machinery for the new Washington treaty cruisers, amounting to approximately $1,500,000, has been received from the navy department by the Westinghouse Electric and Manufacturing Co., it was announced June 29.

The 10,000-ton scout cruisers, designed as Nos. 32, 34 and 36, are in the course of construction at New York, Philadelphia and Bremerton, Wash., navy yards. An additional order was also placed by the navy department for equipment of the three vessels with the recently developed Westinghouse propeller-type blowers for furnishing air under pressure to the fire rooms.

Plans for a new 13-knot Red "D" liner, slightly smaller than the CARACAS, are expected to be soon submitted to prospective bidders for the building contract. The vessel will be primarily a cargo carrier, but will have accommodations for a few passengers.

Bids were asked recently for the construction of a stern wheel passenger vessel on the Pacific coast. The contract was awarded the Marine Construction Co., of Seattle.

United States Second

(*Continued from Page* 36)

comparison for the last two quarters is given in the following table of gross tonnage:

	June 30, '30	Mar. 31, '30
Motor Vessels ..	1,920,505	1,931,362
Other types	1,137,230	1,334,567
World Total ..	3,057,735	3,265,929

At this time last year only 1,432,000 gross tons of motor vessels were under way, as compared to 1,406,000 tons of all other types of merchant ships.

The tonnage comparison between the groups of countries is shown in the following table:

	Britain & Ireland	Other Countries
Motor Vessels	831,159	1,089,346
Other types	560,904	576,326
Total	1,392,063	1,665,672

While the total tonnage of motorship construction showed a decline in the United States and Japan during the quarter just ended, gains were reported for the other countries. Only about 15 per cent of the shipbuilding in the United States is of motor vessels, as compared with about 20 per cent at the end of the March quarter. The comparison in motorship building between the last two quarters is shown in the following gross tonnage table:

	June 30, '30	Mar. 31, '30
Great Britain & Ireland	831,159	876,960
Holland	173,237	158,830
Germany	164,505	116,745
Russia	139,011	106,788
Sweden	115,850	109,760
Japan	111,042	146,310
Denmark	104,622	97,580
United States	35,779	46,269

Declines in the aggregate horsepower of all types of marine engines building throughout the world were shown during the last quarter.

For oil engines, the world total at the end of June was 1,430,417 indicated horsepower, as against 1,559,955 at the end of March. For Great Britain and Ireland there was a decrease from 457,932 to 423,201; for Germany, from 257,955 to 233,576; Denmark, from 209,285 to 158,170; Sweden, from 100,295 to 91,460; Holland, from 100,996 to 88,330; Switzerland, from 106,950 to 78,890; and for the United States, from 44,892 to 31,075. In the same period, Italy's figure increased from 103,500 to 127,940, and Japan's from 84,400 to 91,275.

For reciprocating steam engines the total indicated horsepower for all countries fell from 506,227 to 426,093. For Great Britain and Ireland, there was a decline from 327,312 to 234,358; and for the United States, from 13,500 to 11,000.

The returns for the shaft horsepower of steam turbines show a decrease in the world total during the last quarter, from 652,434 to 554,260. But while the aggregate for Great Britain and Ireland fell from 321,469 to 233,760, that for the United States increased from 118,500 to 175,500.

The comparison of the various countries in the amount of building under way in the last two quarters is shown in the following table of gross tonnage:

Place	June 30, '30	Mar. 31, '30
Great Britain & Ireland	1,392,063	1,614,993
United States	238,163	222,974
Germany	237,468	231,162
Holland	187,445	178,683
France	186,960	182,930
Russia	156,621	122,598
Italy	143,075	144,358
Sweden	126,980	120,490
Japan	121,607	167,055
Denmark	115,991	109,414

Board to Sell Ships

The Merchant Fleet Corp. on June 24 was authorized to advertise 18 idle ships for sale for scrapping. Bids are to be received at 12 o'clock noon, Aug. 1, 1930, and sale will be made on the basis of the highest offers received either from citizens of the United States or aliens. Offers will be received on the basis of pledges to completely dismantle and scrap the ships and to citizens of the United States only on a basis of converting the vessels to barges.

Ocean Mail Bids Opened for Oriental Service

On June 27, Assistant Postmaster General W. Irving Glover opened bids for ocean mail service on the proposed route from Portland, Ore. via Yokohama and Kobe, Japan, and Shanghai, China, to Manila. Two bids were received, one from the Admiral Oriental line, Seattle, Wash. for vessels of class five, $4.00; vessels of class four, $5.45; class three, $8.00 and class two, $10.00; the other from the Pacific Atlantic Navigation Co. for vessels of class four, $6.00, for vessels of class three, $8.00; for class two, $10.00 and for class one, $12.00.

Vessels of class four with a speed of 16 knots at sea in ordinary weather and of not less than 10,000 tons with first class quarters for 125 passengers and with about 45,000 cubic feet of refrigerated space for cargo are to be built for the service. Three such new vessels must be put into operation within two years and one month from the date of the formal award of the contract; and two additional such vessels must be built and placed in service within thirty-one months. It is estimated by the department that this shipbuilding program will involve an expenditure of at least $20,000,000.

Electric Lightships

(*Continued from Page* 26)

erwise than by steam is a distinct advantage, for the older type of lightship had to carry approximately 75 tons of water for the operation of the steam fog signal, no means being possible for condensing the steam. The new vessels require no fresh water except for ship's use.

Wherever practicable, all work about the ship is accomplished with electrical equipment. There are electric lights throughout, electric mechanical refrigeration, electric motor driven pumps for water, oil, etc., and a large storage battery for use as a stand-by for radio and auxiliary purposes.

The vessels are equipped with two 7000-pound cast steel anchors, each with 150 fathoms of 2-inch cast steel stud link chain cable, made by National Malleable & Steel Castings Co. These are of the largest and heaviest type of moorings used in the lighthouse service.

The new lightships are, BLUNTS, No. 100 SWIFTSURE, No. 113, FIRE ISLAND, No. 114, built by Albina Marine Iron Works, and FRYING PAN, No. 115; FENWICK, No. 116; NANTUCKET, No. 117, built by Charleston Dry Dock Machine Co.

Of the six vessels in this class, which were contracted for, two are already on station. Blunts reef lightship is stationed off the coast of California, Umatilla lightship is just off the entrance to the strait of Juan de Fuca, Washington. Others will be placed at Fire Island, east of New York harbor; on Nantucket shoals, southeast of Cape Cod; on Frying Pan shoals, North Carolina; and off Fenwick Island shoal, Delaware.

Pulverized Coal Installations

The Todd unit system of pulverized coal burning is being installed in the steamer FRANK C. BALL, owned by the Construction Materials Corp. Chicago. The steamer is being converted to a dredge by the American Shipbuilding Co. in Cleveland under the direction of J. R. Sensibar, presiden of the Construction Materials Corp. H. N. Herriman, naval architect, and C. R. Fisher, consulting engineer, are in charge of the work. This dredge will be fitted with three Todd triplex pulverizers each to be driven by an electric motor. There are three single end Scotch boilers of three furnaces each.

The Todd unit system will also be installed on the steamer BREMERTON, which will be converted to a self-unloading bulk carrier at the yard of the Jahncke Dry Dock Co., New Orleans. The steamer LORAIN will be fitted with three Todd triplex mills to fire three single end Scotch boilers.

New Trade Publications

ELEVATORS—Elevator equipment manufactured by the Warner Elevator Mfg. Co., Cincinnati, is described in a bulletin covering an installation in a plant where accurate leveling and smooth operation are essential.

LOCOMOTIVE CRANES— Industrial Brownhoist Corp., Cleveland, describes its gas and diesel-powered locomotive cranes of 10 to 40 tons capacity. Illustrations show the cranes in action in a large number of applications. A detail diagram shows the parts and tables cover capacities and clearance dimensions.

WATER SCREENS—Link-Belt Co., Chicago, has compiled a booklet on its 1930 model traveling water screen for clearing intake water of debris detrimental to operation of condensers and pumps. Illustrations present cross sections of the complete screen and its cleansing devices and a large number of installations.

AIR COMPRESSORS—Portable air compressors manufactured by the Sullivan Machinery Co., Chicago, form the subject matter of a catalog by that company, just issued. It describes the company's line of portable gasoline engine driven compressors. A new unit has been added to the line, of 66 feet capacity. Details and dimensions of the machines are given. Numerous illustrations show these compressors in use in various ways.

PUMPS—James T. Castle, merchant engineer, Pittsburgh, is distributing a catalog of the Peerless Pump Co., Los Angeles, describing its deep well turbine pumps for 6 to 18-inch diameter wells or larger, of 30 to 7000 gallons per minute capacity for wells of any practical depth. Illustrations show details of the pumps and diagrams cover further information. Tables show friction of water in pipes and flow of water in concrete pipes.

GRILLE FRAMES—Harrington & King Perforating Co., Chicago, is producing a new device for framing metal grilles, which is described in a current catalog. The sides and corners are stock, the former to be cut to any size and the whole assembled by screws about the metal grills, which can be cut from stock sizes. The catalog shows methods of assembly.

WIRE TABLES—Tables of strength of its copper welded wire have been published by the Copperweld Steel Co., Glassport, Pa. The tables show breaking strength in pounds, of various types of wire, loading tables and tables for cables.

CRANES — Northern Engineering Works, Detroit, has issued a catalog of its cranes, in a looseleaf binder. It covers the entire line and is illustrated to show the mechanism and various features of construction. The catalog contains various bulletins bearing on the use of cranes for various purposes.

ARC WELDING—A complete and well illustrated booklet devoted to automatic arc welding by the electronic tornado process has been issued by the Lincoln Electric Co., Cleveland, giving detailed information on automatic welding with the carbon arc process. Results of tests of strength and ductility are tabulated. A section of the booklet is devoted to the automatic tractor type welder as applied to the shipbuilding industry.

FLOODLIGHTS—Catalog 312, superseding all of its previous floodlight catalogs, has been issued by Crouse-Hinds Co., Syracuse, N. Y. A classification of floodlights is given as well as details governing the selection of floodlights. Tabulations include data on lamps, projectors, lenses, etc. Various calculation charts are given.

FATHOMETER — The Submarine Signal Co., Boston, has issued a booklet describing the fathometer, which has been installed on over 200 vessels. The advantages of visual echo depth sounding furnished by the fathometer are clearly set forth and the principles of its operation defined. The booklet is well illustrated and includes also testimonials from users of the device.

MACHINE TOOLS—Bulletins suggesting methods of performing various machining operations on its machine tools have been issued by the Gisholt Machine Co., Madison, Wis. They cover a variety of operations, with illustrations showing how machine is set up and operated to produce results. They are part of the service offered by this tool manufacturer.

TRAMRAIL—A bulletin by the Cleveland Electric tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O., is devoted to safe handling of loads overhead by means of its rail and carrying devices.

LUBRICATION—The current issue of the Texas Co. devoted to lubrication takes up lubrication developments and their development. This is a discussion of factors and design to be considered by the engineer in deciding the grade of lubricant for a given purpose. Illustrations give point to the text.

Business News for the Marine Trade

The Marine Glider Corp., Marblehead, Mass., has been incorporated by Dana Jefferson and H. H. Talbot to manufacture amphibian gliders.

The National Engine & Boat Co., Ira Hand, secretary, 420 Lexington avenue, New York, is reported to be inspecting sites in Sacramento, Calif., for the construction of a new plant.

The Oak Street Ferry Co. Inc. has been incorporated by Joseph A. Bisso, 171 Walnut street, New Orleans, La.

The Pensacola Metal Aircraft Corp., Pensacola, Fla., is arranging for the manufacture of the Wittemann flying boat at the plant of the Pensacola Shipbuilding Co. Buildings are being remodeled by the shipbuilding company to meet the purpose of the aircraft corporation. Dural will be used throughout in the construction of the planes.

The Hampton Roads Shipbuilding Corp., Norfolk, Va., recently leased approximately 80 acres of the Pennsylvania railroad's Pinners Point waterfront property with an option to buy the land. Work will be started on the construction of two building ways capable of building 1000-foot vessels in the near future and negotiations are well under way for other contracts. The offices of the company will be moved to Pinners Point in the near future. Removal of the corporation's machinery to the new location has already begun.

The Prest-O-Lite Co., 30 East 42nd street, New York, has placed in operation a new plant for the manufacture and distribution of dissolved acetylene at Casper, Wyo. The new plant will accommodate the increasing need of users of oxy-acetylene welding and cutting process in this region and is located on a private siding of the Chicago, Burlington & Quincy railroad. The address is 648 Bryan Stock Trail, Casper, Wyo.

The Great Lakes Boat Building Corp., Chicago, recently organized to take over a company of the same name, plans expansion of its plant at 3250 Washtenaw avenue. The company builds and repairs boats.

The Cox & Stevens Aircraft Corp., New York, was recently incorporated with 500 preferred and 100 common shares by Daniel H. Cox of Cox & Stevens, naval architects, 341 Madison avenue, New York, to manufacture and deal in aircraft.

The Northwest Aero Marine Ltd., Winnipeg, Man., has been incorporated with $100,000 and 15,000 no par shares by Arthur E. Johnson and Roderick K. Finlayson to manufacture and deal in aeroplanes and hydroplanes.

Fuller Lehigh Co., manufacturers of pulverized coal firing equipment and Bailey water cooled furnace walls, have opened a new sales office in the Candler building, Atlanta, Ga., in charge of J. Mc. C. Hill. The main offices and works of Fuller Lehigh Co. are located at Fullerton, Pa.

The B. F. Sturtevant Co., Hyde Park, Boston, Mass., manufacturers of blowers, heaters and ventilators, announce the removal of their Minneapolis branch office from 1024 Metropolitan Life building to 874-875 Northwestern Bank building. P. A. Dwyer will remain in charge.

Taylor-Wharton Iron & Steel Co., High Bridge, N. J., producers and founders of iron and steel since 1742, and the original producers of manganese steels in this country, have added an alloy steel division for the manufacture on a production basis of Tisco Nirosta KA2 castings for corrosion and heat resistant applications. The line includes marine castings, ornamental hardware, and castings for the industrial field generally. This new division, which has been operating for some time, is the result of a year's experimental work by the company.

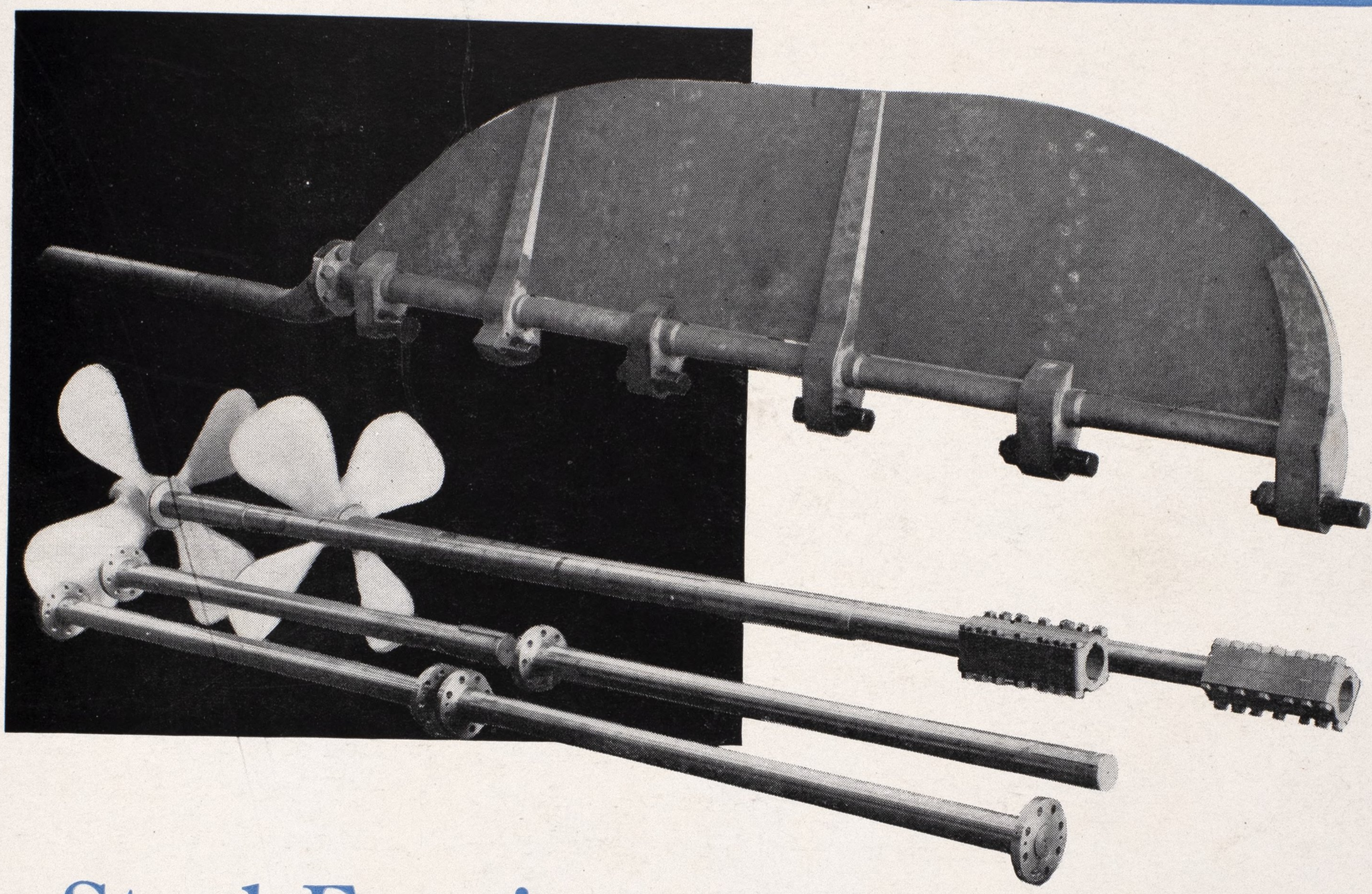
Lukenweld Inc., a subsidiary of the Lukens Steel Co., Coatesville, Pa., has been formed with G. D. Spackman as president. The new company will supply welded steel construction to manufacturers of machinery and equipment. About 50,000 square feet of manufacturing space have been provided for this activity at the Coatesville plant.

Marine Review

Reg U.S. Pat. Off.

The National Publication Covering the Business of Transportation by Water

August, 1930



Steel Forgings and Steel Castings for Ships

Propeller Shafts	Diesel Engine Crankshafts
Line Shafts	Piston Rods
Thrust Shafts	Connecting Rods
Generator Shafts	Cast Steel Propellers
Turbine Forgings	Barge and Dock Castings
Rudder Stocks	Engine Pump, and Compressor Castings

Carbon or Alloy Steels

Basic or Acid Process

ERIE FORGE COMPANY

Works and Main Office Erie, Pa.

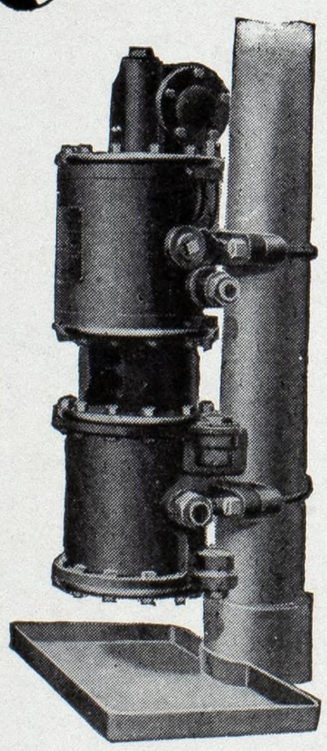
Branch Offices:

New York Philadelphia Pittsburgh St. Louis Milwaukee San Francisco
Chicago Cincinnati Buffalo Cleveland Seattle

Scaling the bulwark of A. H. Bull & Co.'s S.S. "Cornelia" with Keller size OX Super Valveless Scaling Hammers—air supplied by Westinghouse compressor.



COMPRESSED AIR CUTS SCALING COSTS



The Westinghouse steam driven Air Compressor is compact, rugged, easy to install, ideal for use on board vessels, in the harbor, and in ship yards. Made in four sizes—35, 49, 66, and 150 cu. ft. displacement . . . Motor driven compressors are also available for every purpose — a complete line, in sizes up to 700 cu. ft.

THE hand chipping method of removing rust, paint, or scale from the deck and sides of a ship is slow and inefficient. The modern way—with compressed air—is quicker, more convenient, more economical.

Many steamship companies have equipped vessels with WESTINGHOUSE compressor outfits for this purpose, finding that for the price of one scaling contract with hand chippers, a complete compressor equipment and accessories could be purchased. This also provides a ready means for cleaning machinery, spraying paint, and making emergency repairs.

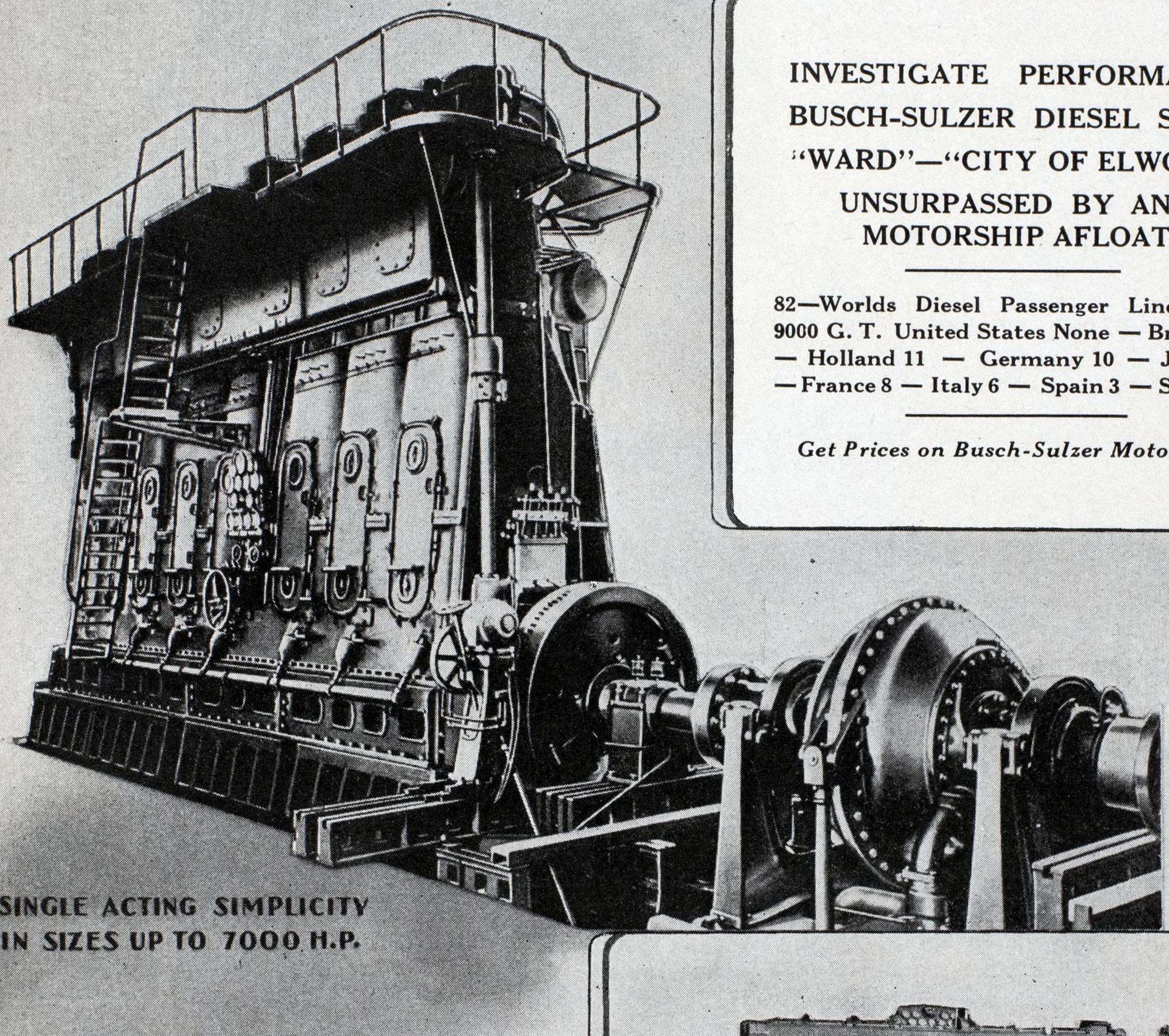
A trial installation on one boat has time and again demonstrated such marked advantages that the entire fleet eventually was equipped.

WESTINGHOUSE TRACTION BRAKE COMPANY
GENERAL OFFICE AND WORKS , , , WILMERDING, PENNA.

WESTINGHOUSE—NATIONAL
AIR COMPRESSORS

BUSCH-SULZER

TWO-CYCLE DIESEL MARINE ENGINES

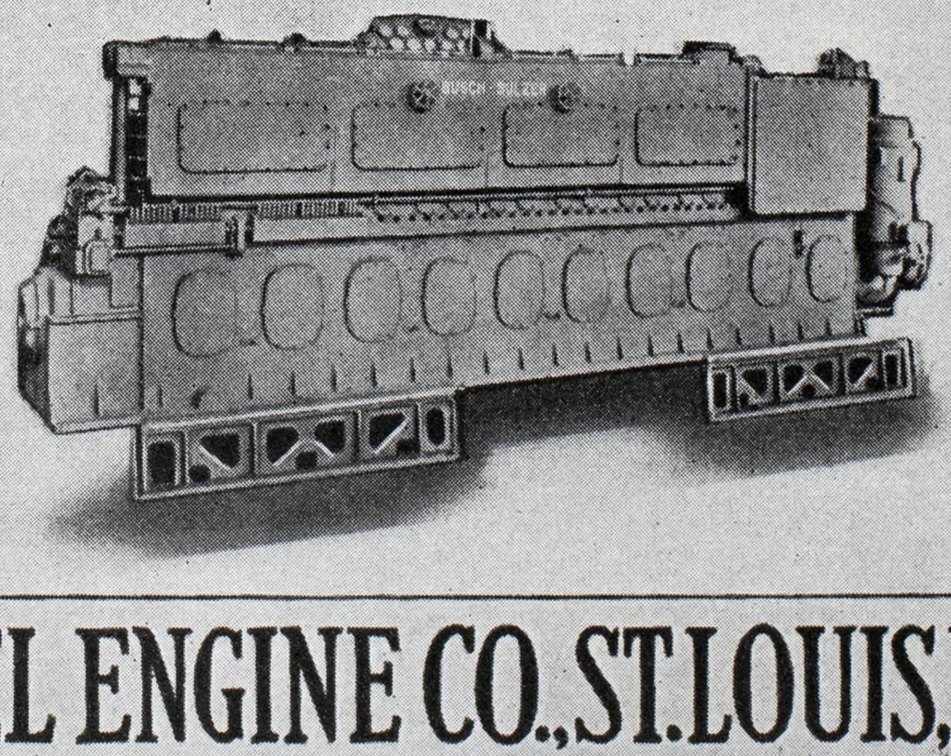


INVESTIGATE PERFORMANCE
BUSCH-SULZER DIESEL SHIPS
"WARD"—"CITY OF ELWOOD"
UNSURPASSED BY ANY MOTORSHIP AFLOAT

82—Worlds Diesel Passenger Liners over 9000 G. T. United States None — Britain 32 — Holland 11 — Germany 10 — Japan 10 — France 8 — Italy 6 — Spain 3 — Sweden 2

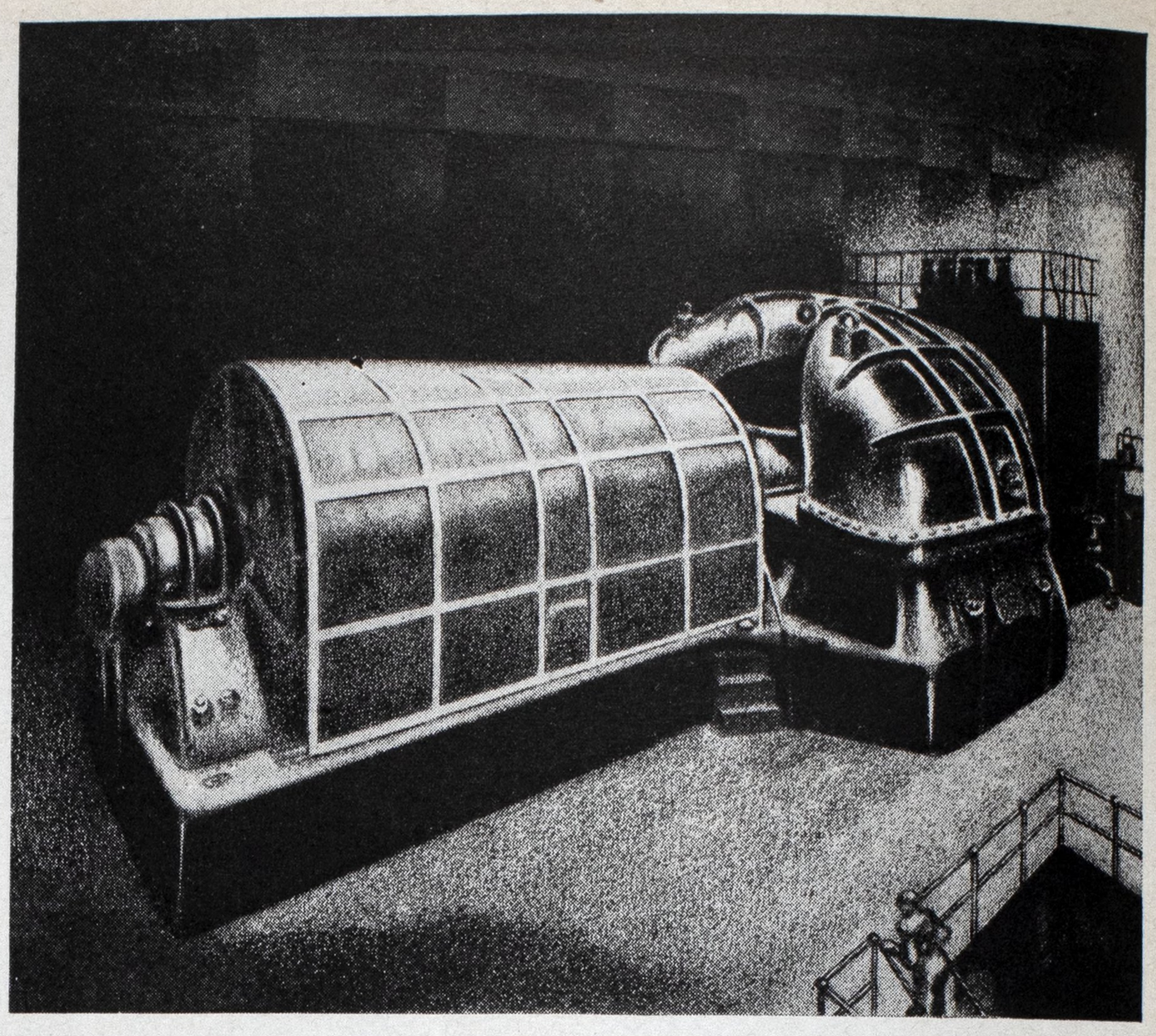
Get Prices on Busch-Sulzer Motorships

SINGLE ACTING SIMPLICITY
IN SIZES UP TO 7000 H.P.



BUSCH-SULZER BROS.-DIESEL ENGINE CO., ST. LOUIS, MO.

TWO RECTOR ST., NEW YORK — **RIALTO BLDG., SAN FRANCISCO.**



Steam turbines . . . massive dynamic producers of vital energy . . . are the giants of modern power on land and sea. They are built with the nicety of a watch and balanced with the delicacy of an airplane propeller. They require special lubricants of the very highest quality. That is why—

Gargoyle D. T. E. Oils lubricate more steam turbines on land and sea than any other brand of oil in the world

QUALITY BRINGS LEADERSHIP

The world leadership of the Vacuum Oil Company in the lubrication field is the natural consequence of its ability to manufacture oils of the highest quality, specially fitted to the important job that each must perform.

Every marine engineer knows that efficient operation of marine machinery depends very largely upon the lubricant and the method of applying it. Experienced Vacuum Oil Company representatives in more than 300 of the world's leading ports are ready at all times to offer expert aid in solving your own particular lubricating problems.

VACUUM OIL COMPANY

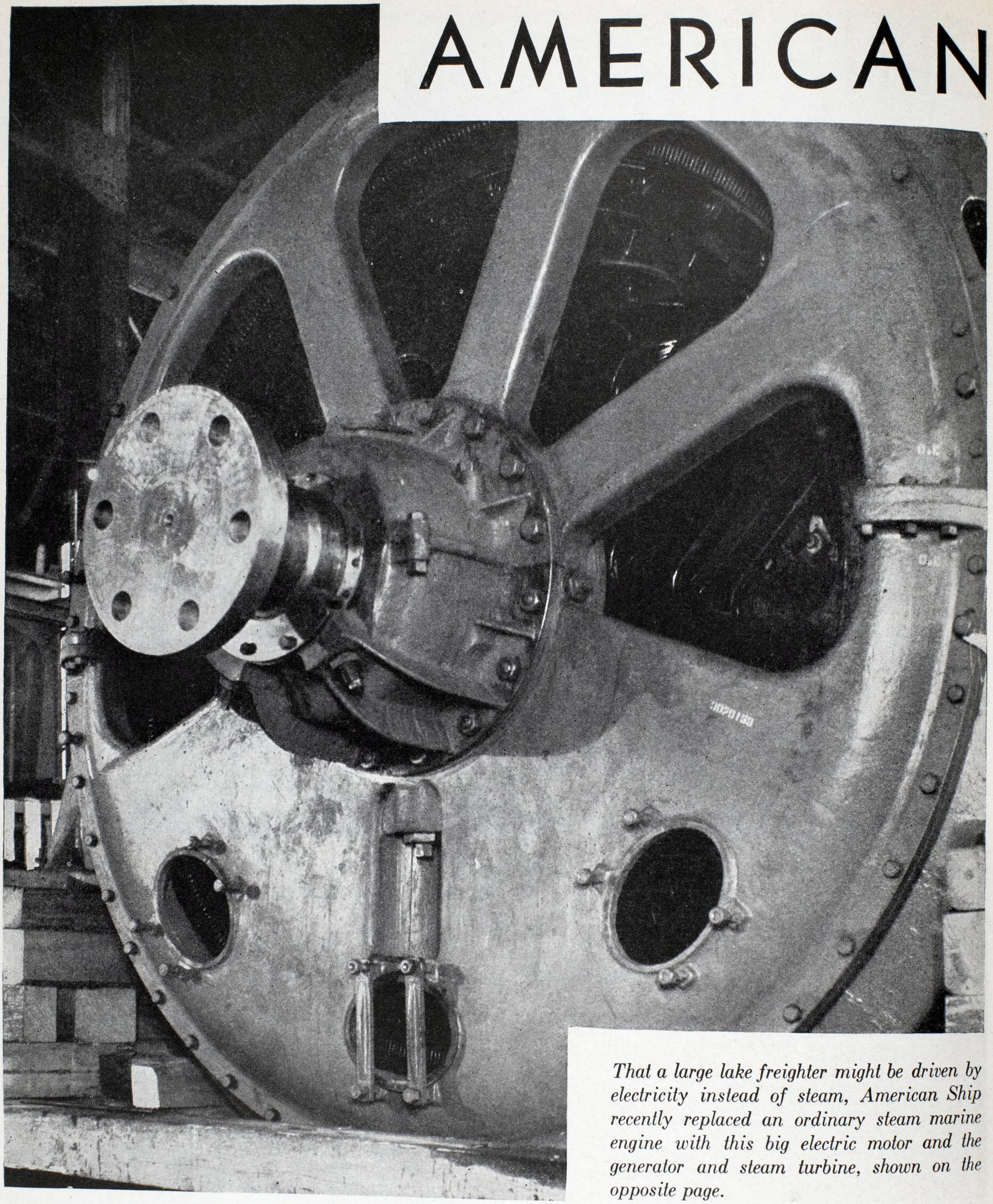
Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world.

GARGOYLE

Marine Oils

A grade for every type of service

AMERICAN



That a large lake freighter might be driven by electricity instead of steam, American Ship recently replaced an ordinary steam marine engine with this big electric motor and the generator and steam turbine, shown on the opposite page.

The AMERICAN

CLEVELAND
American Ship Building Co.

LORAIN
American Ship Building Co.

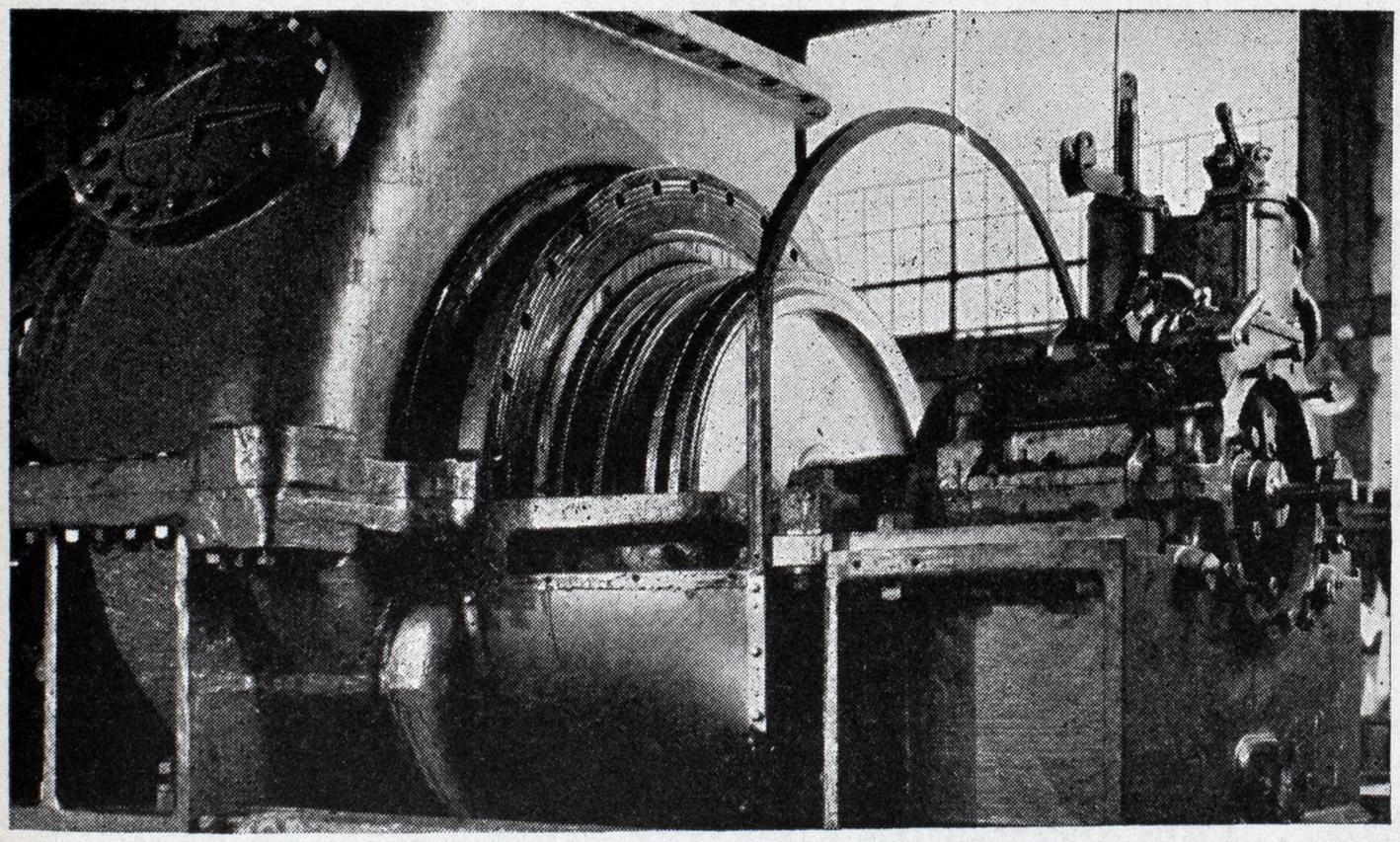
BUFFALO
Buffalo Dry Dock Company

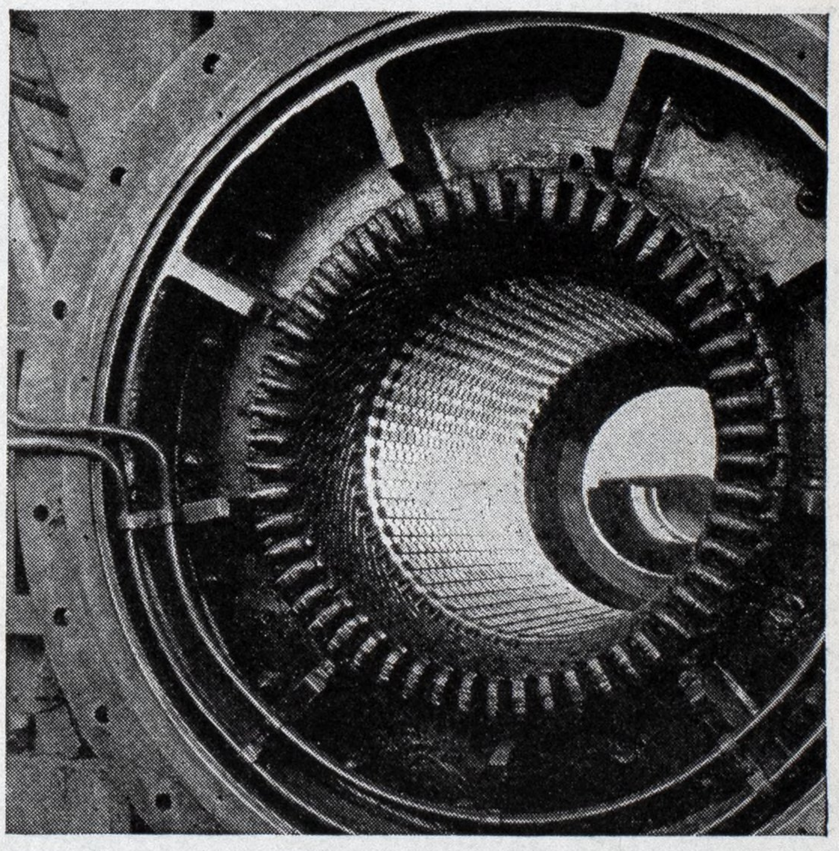
SHIP *has only one viewpoint in repair work* . . . . THE PERMANENT SATISFACTION OF ITS CUSTOMERS

WHENEVER you send a ship to any yard of the American Ship Building Company for repairs, you get dependable work—and you get it as swiftly as possible. For American Ship has only one viewpoint in its repair work, and that is the permanent satisfaction of its customers.

To accomplish this, American is ever alert to keep equipment, methods and manpower at top-notch efficiency in each of its five convenient ship yards. American's entire personnel, spurred on by a sense of corporate responsibility which has practically fused with personal responsibility, zealously supports this policy. The outward manifestation of this craftsmanlike spirit is speedy, reliable work, which helps make every repair job a *good* job.

That American's customers appreciate this is evident from the increasing frequency with which they send us minor repair jobs in addition to the big ones. Other ship operators and owners are also coming to realize that good repair work costs less in the long run, and they, too, are turning to American for *all* their repair work—big jobs and little.





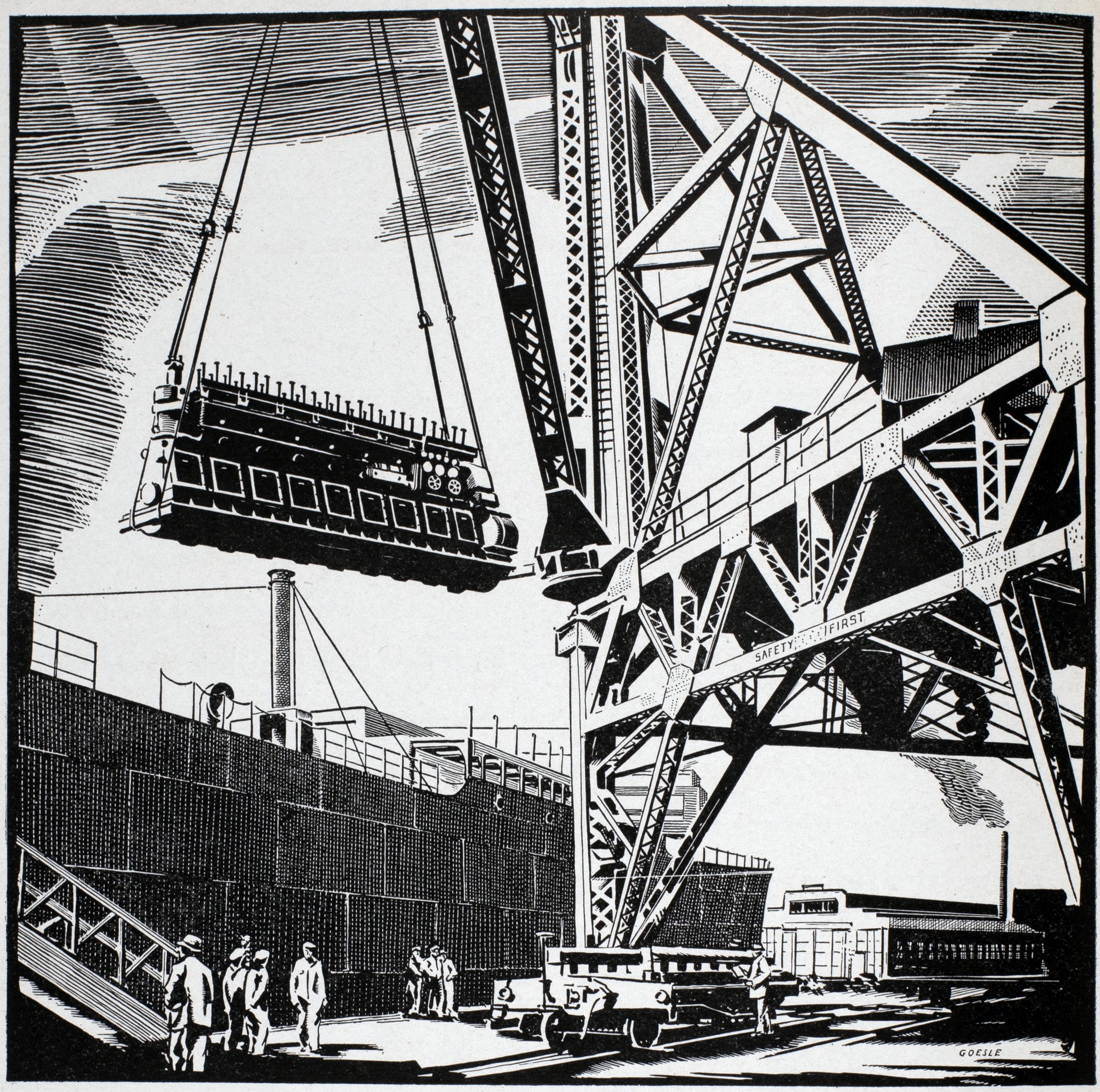
SHIP BUILDING CO

SOUTH CHICAGO
Chicago Ship Building Co.

SUPERIOR
Superior Shipbuilding Co.

SHIPS GOOD BUILDS FEDERAL

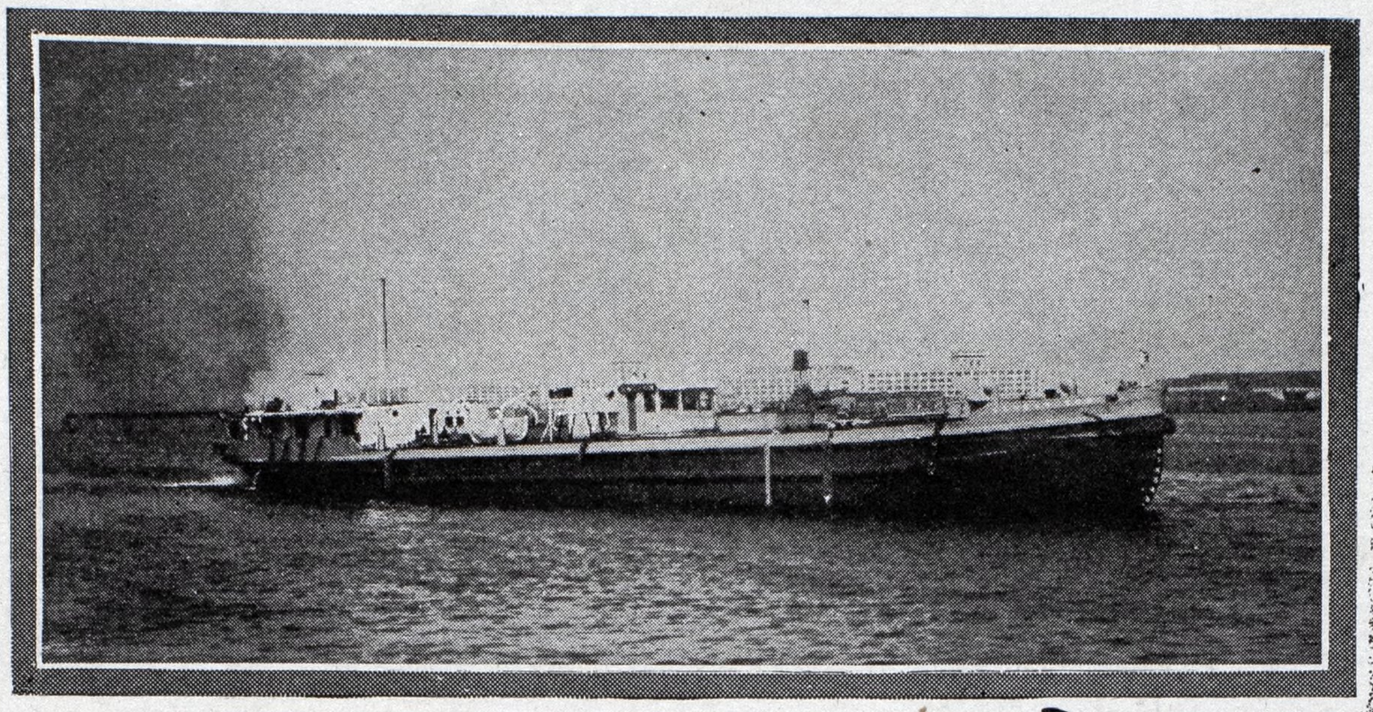
SHIP MACHINERY INSTALLATIONS

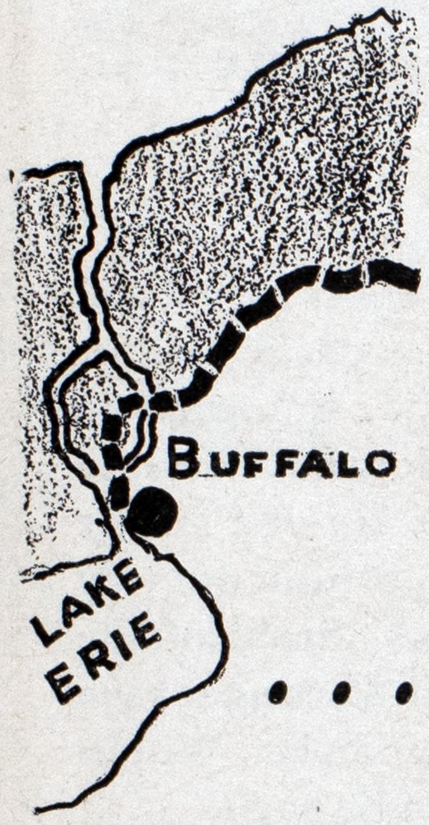


Whether you select Steam or Diesel power with Direct, Geared or Electric drive, the full benefits of modern machinery are only secured when accompanied by installation work of superior quality...Federal's installations include seven different makes of Diesels in ten ships, and the first High Pressure Steam in an American merchant ship...This diversified experience enables Federal to offer...DEPENDABLE INSTALLATIONS OF MODERN MACHINERY.

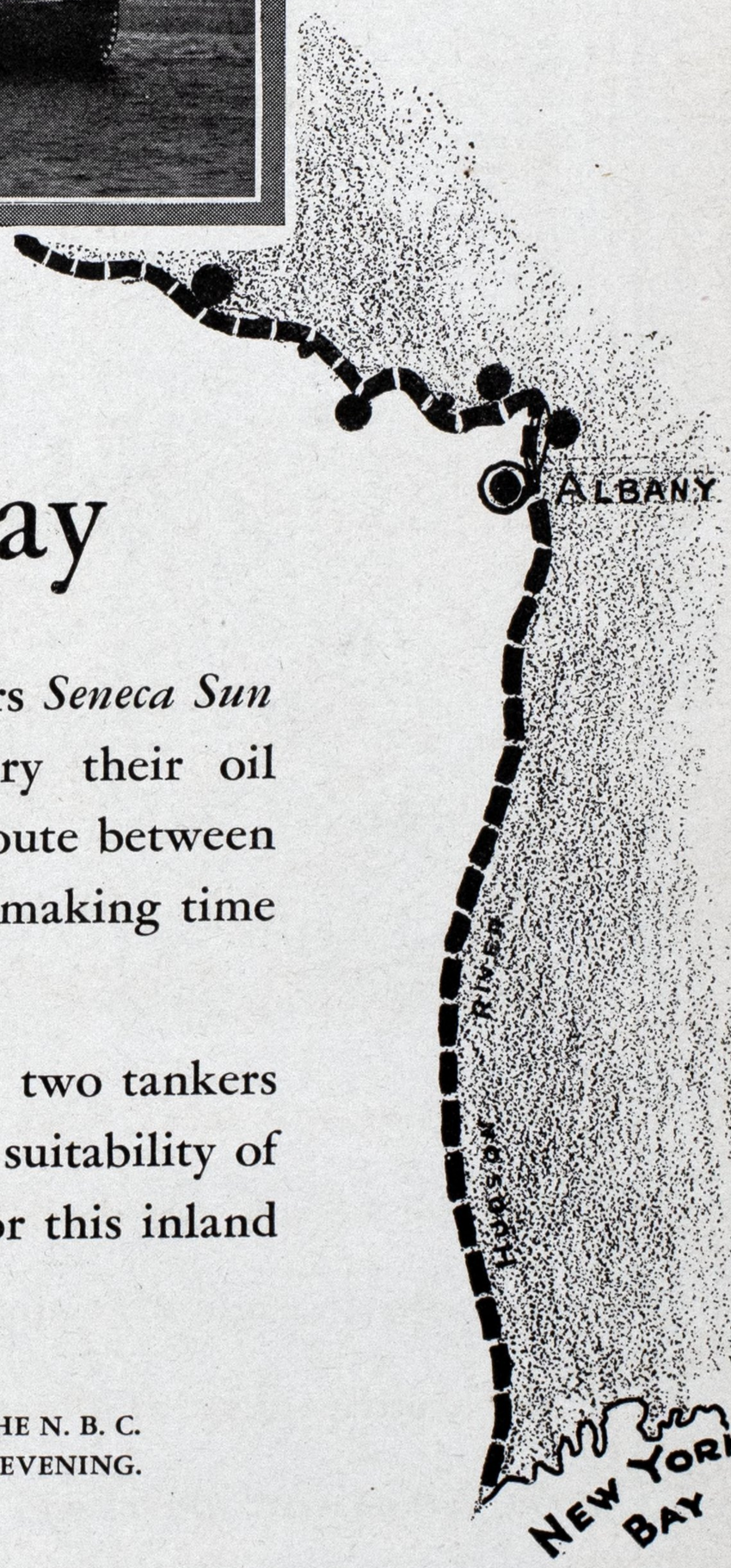
FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
GENERAL OFFICES AND WORKS: LINCOLN HIGHWAY, KEARNY, NEW JERSEY
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

4 DAYS ---





. . . *from* Lake Erie *to* New York Bay



THE Diesel electric powered tankers *Seneca Sun* and *Cayuga Sun* consistently carry their oil cargoes over a river, canal and lake route between New York and Buffalo in the profit-making time of only four days.

By this creditable performance these two tankers supply additional proof of the entire suitability of Westinghouse Diesel electric drive for this inland waterway service.

TUNE IN THE WESTINGHOUSE SALUTE OVER THE N. B. C.
NATION-WIDE NETWORK EVERY TUESDAY EVENING.

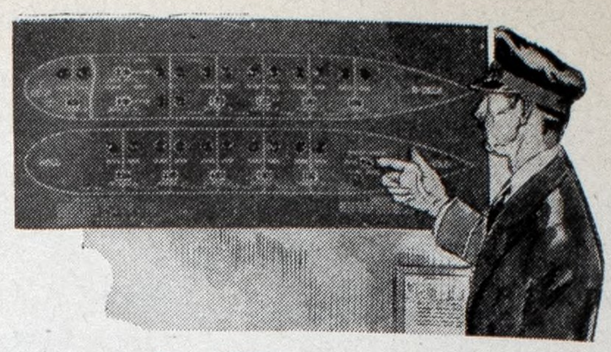
Service, prompt and efficient, in all principal American ports

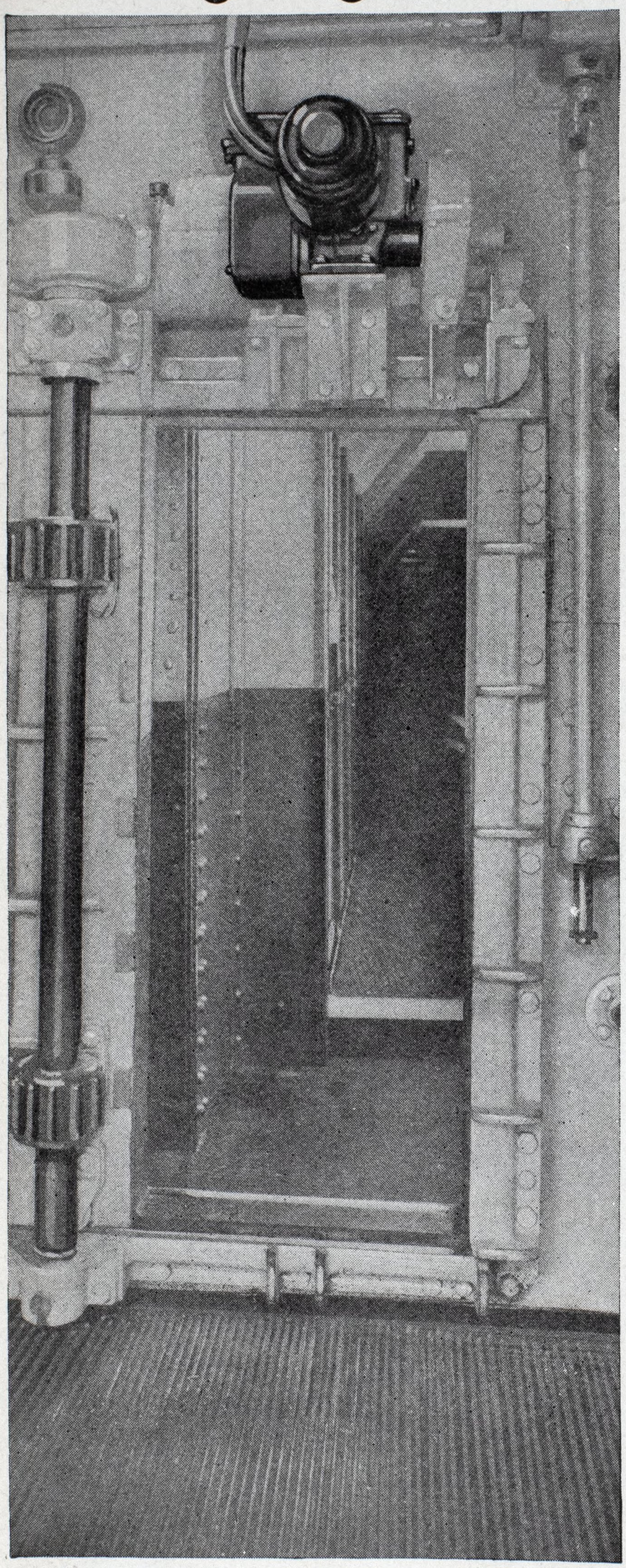
Westinghouse

WESTINGHOUSE ELECTRIC

T 31224

Bringing Finger-Tip Control of Every Bulkhead Door to the Pilot-House





The officer in the pilot-house of the S. S. California shuts or opens this and the other watertight doors within a few seconds by means of the Cutler-Hammer Watertight Door Control.

THE old method of closing bulkhead doors by manual operation was always slow as well as dangerous for the crew. Cutler-Hammer Watertight Door Control now makes it possible for the officer in the pilot house to close or open any or all bulkhead doors by a flip of a master control switch. Lights flash to him the position of every door, whether open, closed or shut. A throw of the switch sounds a local signal, starts a high starting torque motor which hits the door with a sharp impact. Within *seconds* it is *closed*—far more quickly than by hand.

Cutler-Hammer Watertight Door Control *permits local operation* either electrically or manually. A control station on each side of the opening enables a trapped sailor, for example, to escape through the bulkhead but the master control in the pilot house always reassumes command and closes the door. Manual operation *never interferes with the electrical operation.*

Like all C-H marine appliances, the Cutler-Hammer Watertight Door Control operates in any crisis. No bulky mechanism or pipes to get out of order—only the simplest wiring system is needed.

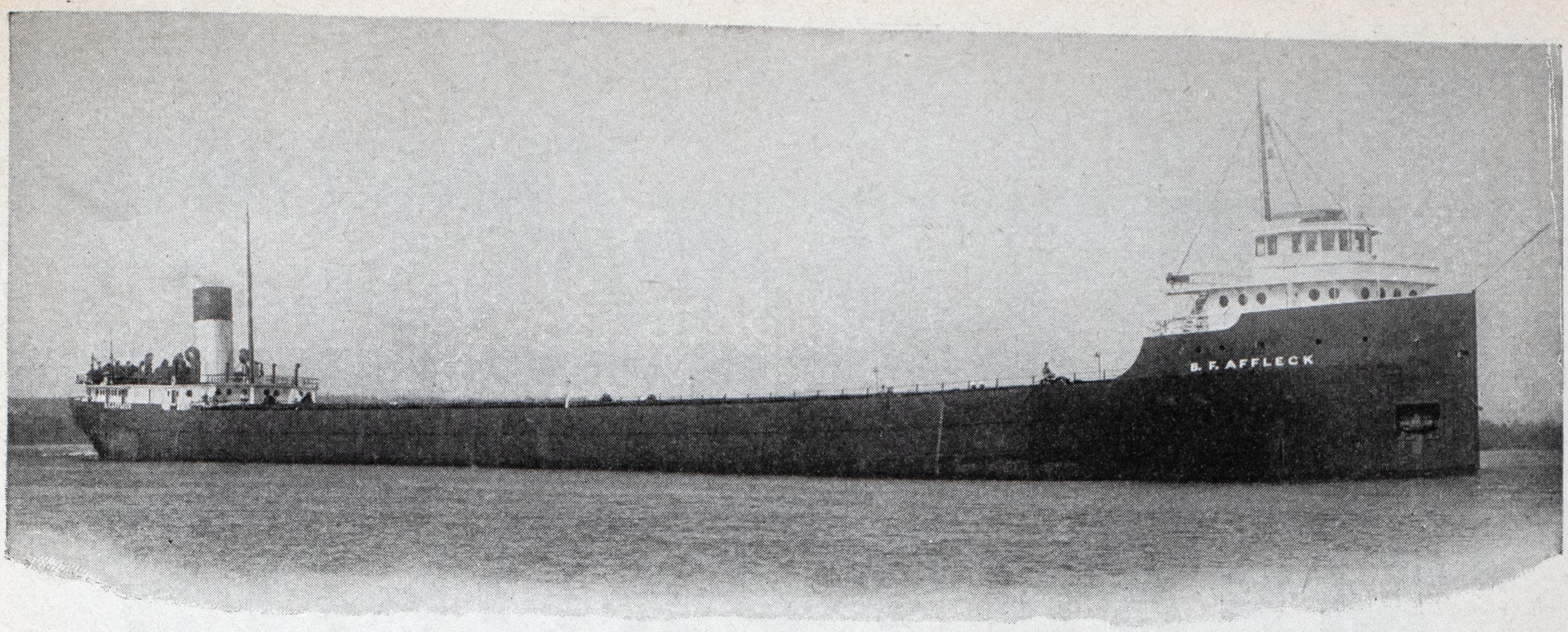
The *first U. S.* vessel to have motor-operated bulkhead doors selected the C-H System without hesitation. Prominent shipbuilders and ship owners are specifying C-H System—for ships on the ways and ships already in service. Their confidence is justified, for the C-H System fully meets every requirement of the International Conference on Safety of Life at Sea. Write at once for complete details.

CUTLER-HAMMER, Inc.
Pioneer Manufacturers of Electric Control Apparatus
1322 St. Paul Ave., MILWAUKEE, WISCONSIN

CUTLER HAMMER

Motor-Driven Bulkhead Door Operating Systems

(A-318)



B. F. AFFLECK

Finest Type of Great Lakes Cargo Carrier

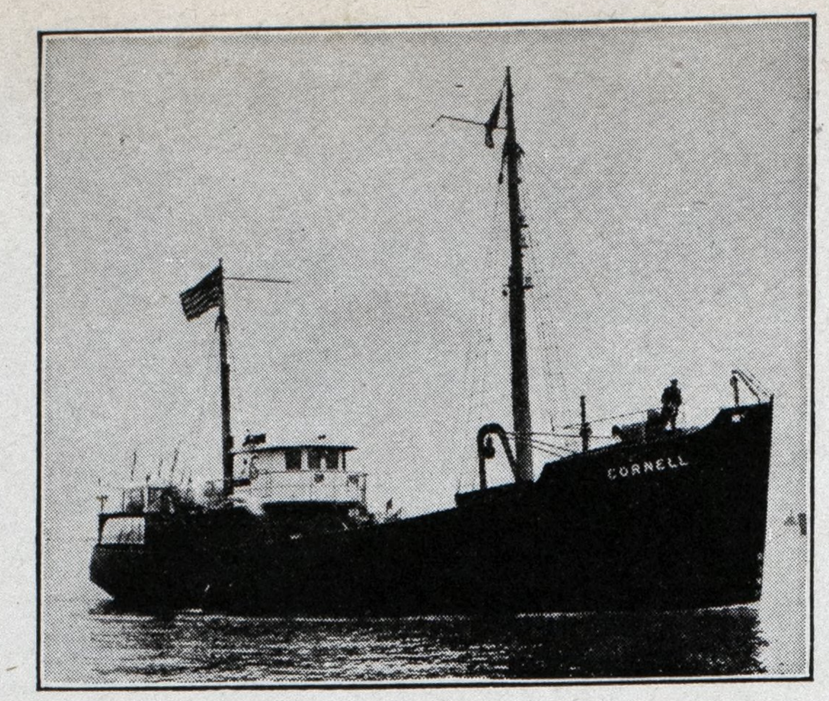
S.S. B. F. Affleck owned and operated by the Pittsburgh Steamship Company, is a single deck bulk cargo vessel of the standard type built for the iron ore, coal and stone trade of the Great Lakes. Her molded dimensions are: Length overall, 604 feet, length between perpendiculars, 580 feet; width 60 feet and depth 32 feet. Capacity 12,000 tons.

A diversified experience, covering the construction of all types of ships, fully qualifies us to meet *your* requirements thoroughly and with despatch.

Some Other Ships We Have Built

Auto Ferry, LA SALLE
Auto Ferry, ESSEX
Car Ferry, WABASH
Car Ferry, CHIEF WAWATAM
Car Ferry, ST. MARIE
Car Ferry, ANN ARBOR No. 5
Twin Screw Excursion Steamer, THOUSAND ISLANDER
Self Unloading, JOHN W. BOARDMAN

Toledo
Shipbuilding Company, Inc.
Toledo, Ohio

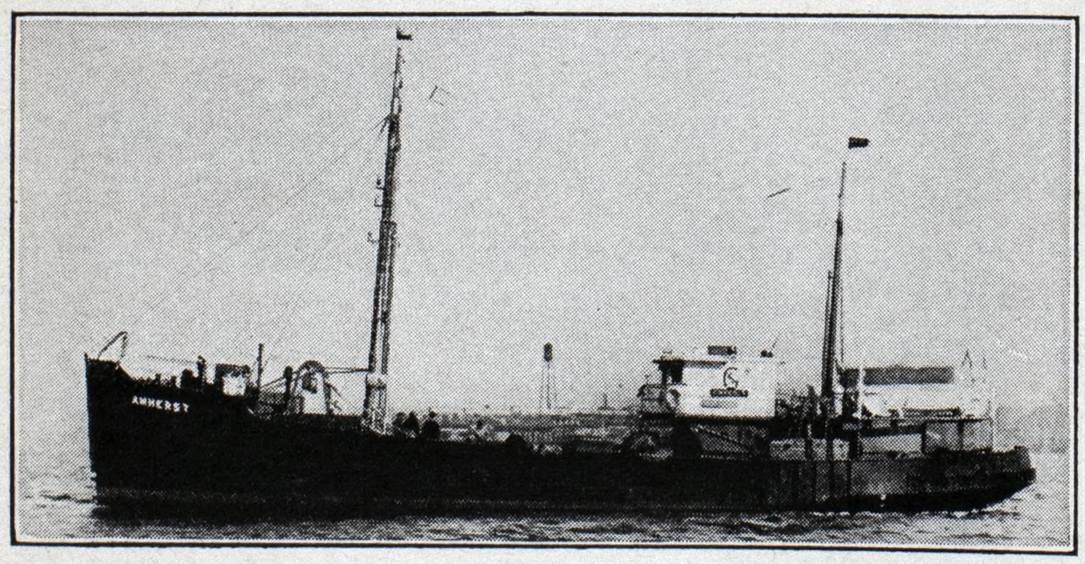


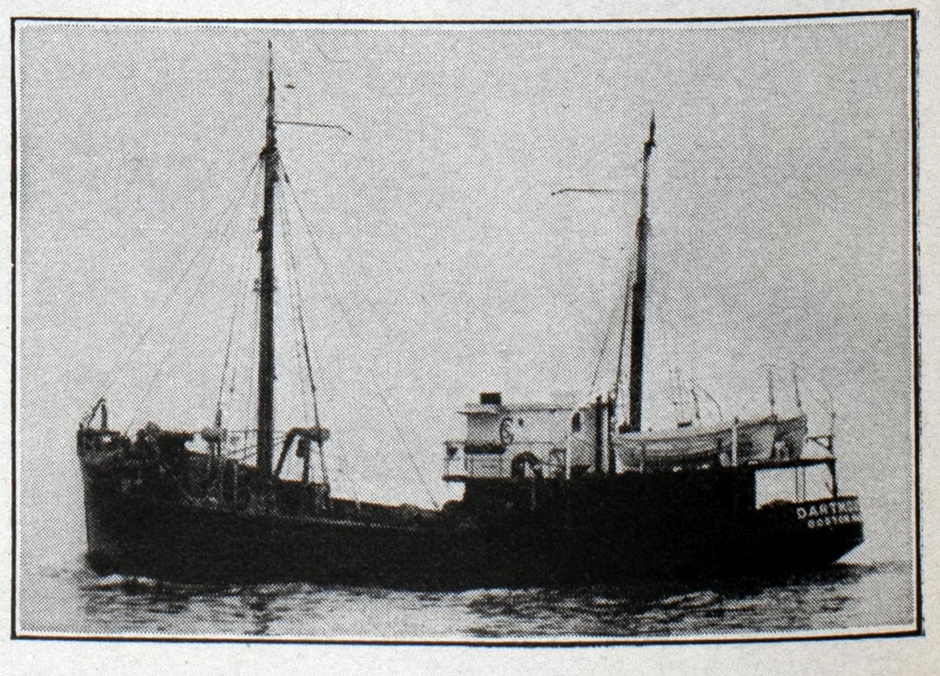
where POWER MEANS PROFITS

Illustrated on this page are three modern steel trawlers of the General Sea Foods Corp., the "Cornell", the "Amherst" and the "Dartmouth", all of which are Cooper-Bessemer Diesel powered.

Length . . . . 110′
Beam . . . . . 22′
Depth . . . 11′ 8″
Speed . . . 11 knots
Power . . 375 H. P.
Cooper-Bessemer Diesel Engines

IN the fishing fleets, the power plant is recognized as a major factor in determining the net profits for the season. From the Banks to the Chesapeake, scores of fishing vessels are constantly demonstrating that Cooper-Bessemer power means more trips—faster trips, less idle time in port—and consequently bigger profits. The performance of Cooper-Bessemer Diesels in the fishing fleets is typical of their performance in other types of commercial marine service. Tugs, tankers, cargo vessels, ferries and towboats—all contribute many striking examples of the outstanding reliability, efficiency and economy of Cooper-Bessemer Diesel marine engines. Where men go down to the sea for profit there is no better a partner than a Cooper-Bessemer engine. There is a size and type for every commercial marine need, in a range of sizes from 60 H. P. to 1500 H. P. For complete details and specifications, write—



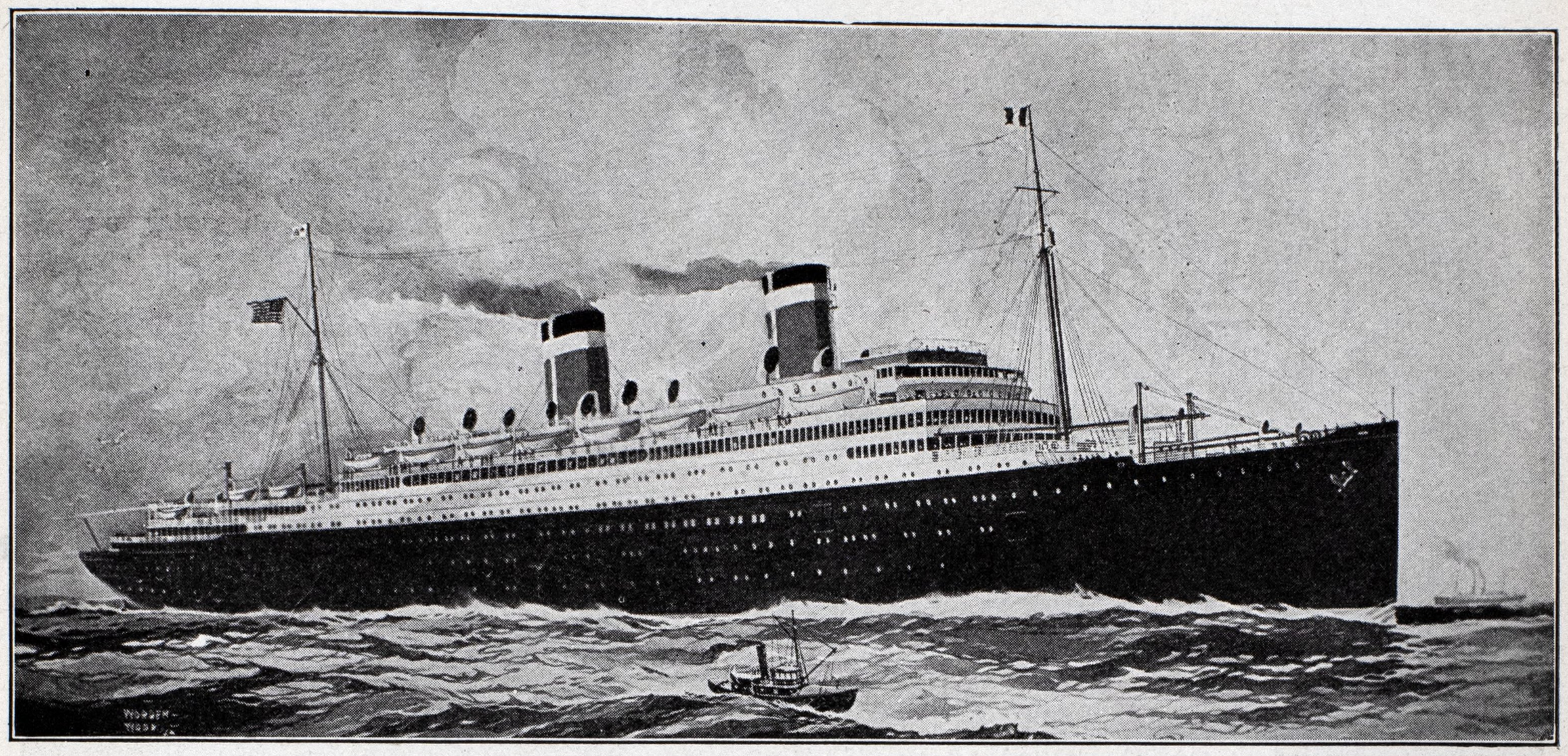


THE COOPER-BESSEMER CORPORATION

General Diesel Sales Offices: Suite 301, 25 West 43rd Street, New York City. *Plants:* Grove City, Pa.; Mt. Vernon, Ohio

Canadian Diesel Representative: Diesel Power Ltd., 129 Adelaide Street, West, Toronto, Ontario, Canada

NEW YORK SHIPBUILDING COMPANY *has under construction for the* UNITED STATES LINES INC.



The Two Largest and Highest Powered American-Built Merchant Ships

Comparative Characteristics

UNITED STATES LINES INC. SHIPS BUILDING		LARGEST SHIP HERETOFORE LAID DOWN
705 ft.—0 ins.	LENGTH OVERALL	652 ft.—11 ins.
86 ft.—0 ins.	BEAM MOULDED	81 ft.— 0 ins.
57 ft.—0 ins.	DEPTH TO SHELTER DECK	52 ft.— 0 ins.
31,000	GROSS TONNAGE	21,000
33,000	SHAFT HORSE POWER	26,500
1,300	PASSENGER ACCOMMODATIONS	460

NEW YORK SHIPBUILDING CO.

Main Office and Works: Camden, New Jersey

New York Office: 420 Lexington Avenue



American Standards at Sea

When you sail in a United States liner you go abroad with the finest American living standards . . . your own accustomed cuisine . . . your own accustomed refinements in accommodations . . . your own language . . . American conveniences, American comforts. And these are so appreciated by the traveling American!

When you ship freight abroad via these lines—and the American Merchant Lines—you command the utmost in American marine efficiency and experience. That saves time . . . patience . . . and money.

See one of our many branches—or your nearest agent—for practical suggestions on travel or shipping between New York and England, Ireland, France and Germany.

The Fleet of Service

Leviathan, world's largest liner—swiftness with comfort! The George Washington, America, Republic, President Harding and President Roosevelt—superb cabin ships. And those dependable cargo vessels of the American Merchant Lines sailing weekly between New York and London direct . . . American Banker, American Farmer, American Merchant, American Shipper and American Trader, each of which carries a limited number of passengers.

UNITED STATES LINES

Geared Turbines Hold the Records

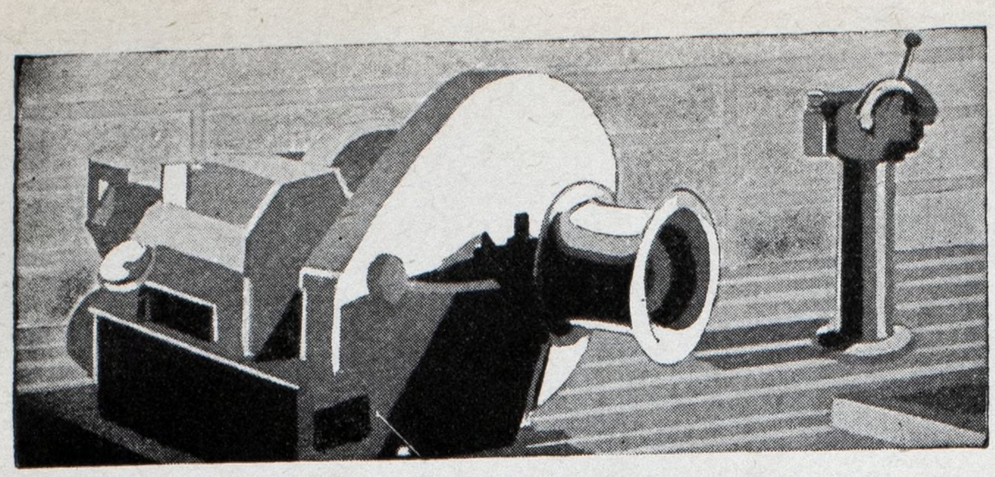
IT IS conclusively demonstrated that geared turbines for the propulsion of ships requiring 3000 hp. or more develop more power and more speed from a given space and weight and from a given first cost and expense for fuel than can be obtained from any other form of power equipment now available.

Numerous De Laval equipped vessels, in both commercial and naval service, such as the DIXIE (here shown), EL OCEANO, MALOLO, YARMOUTH, NEW YORK, BOSTON, MUNARGO, etc., and a long list of U. S. Scout Cruisers and Destroyers attest the entire reliability and smooth operation of De Laval Turbines and Gears



De Laval Steam Turbine Co., Trenton, N. J.

AD-2022

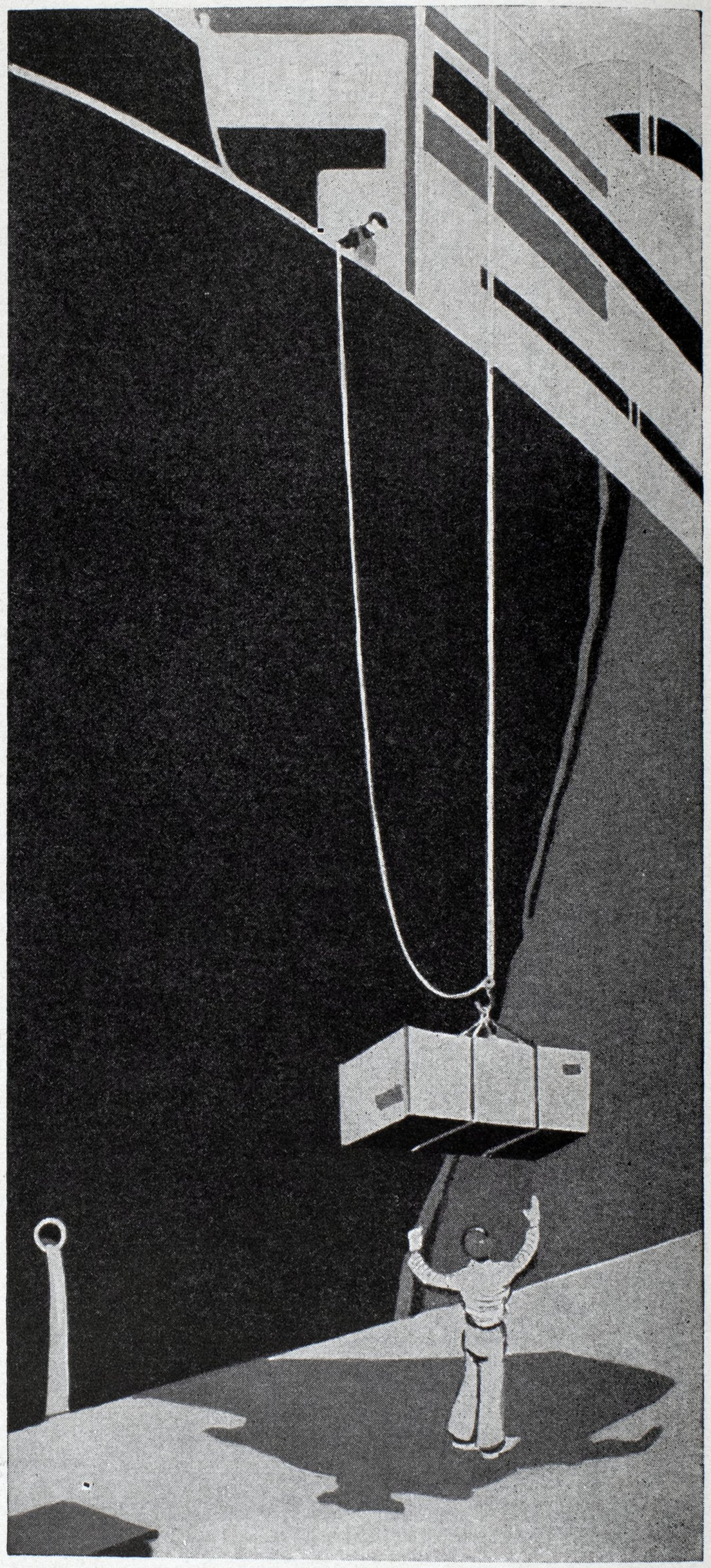


A FEW SMALL LEVERS

THE unseen power which drives the all-electric ship manifests itself in many ways. It comes, at the turn of a few small levers, to the anchor windlass, the capstan, the cargo winches, the rudder, the pumps, or the boat hoists. Simply, certainly, speedily, they do the bidding of even an inexperienced operator.

Motors and a few small levers have made responsive deck hands of ships' auxiliaries. Never jeopardize their usefulness with electric equipment of uncertain worth. G-E motors and control are products of careful study and design—bred to the sea.

General Electric also manufactures complete turbine propulsion machinery, electric equipment for Diesel-electric drive, searchlights, and other electric marine accessories. Its exceptional facilities and practical experience are at the disposal of ship builders and ship owners who would keep in step with maritime progress.

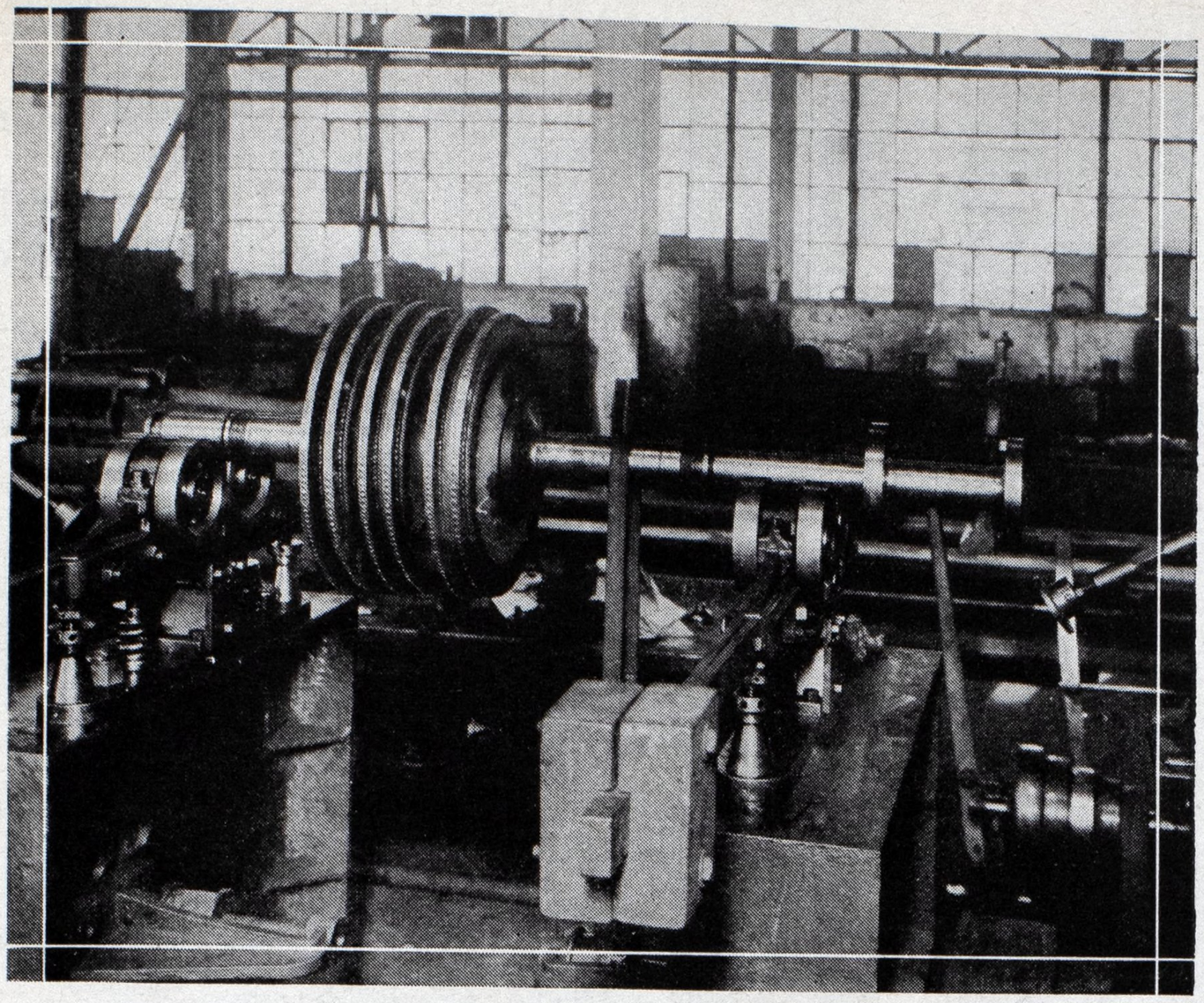


231-27

JOIN US IN THE GENERAL ELECTRIC PROGRAM, BROADCAST EVERY SATURDAY EVENING ON A NATION-WIDE N.B.C. NETWORK

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES



High pressure rotor of the Holland-American liner Beemsterdyck in United's dynamic balancing machine

UNITED SERVICE IS SUPERIOR SERVICE

THE modern shipyard is able to do an efficient job only if it maintains every facility required in the repair of a ship—plus SERVICE.

Between the award of the contract and the rendering of the bill it is SERVICE that counts. SERVICE is the difference between a job just done and a job well done, the difference between a satisfied and a dissatisfied ship owner.

With its five plants United Dry Docks, Inc., offers the ship owner every modern facility—plus a Superior Service. Whether the job calls for the services of specialized Diesel engine mechanics, turbine repair or construction, special castings, the ordinary or unusual ship repairs—If it Can be Done United Can Do It.

United's facilities include new and complete equipment for the construction and repair of turbines at its Fletcher Plant—builder of so many of the famous Fletcher-Parsons Turbines. United's Diesel engine division at the Morse Plant and its foundry at the Staten Island Plant are without equals in the Port of New York.

United's five plants are conveniently located—three in Brooklyn, one in Hoboken and one on Staten Island. And above all, United Service is Superior Service.

The Mark of Quality in Ship Repairs

STATEN ISLAND-MORSE-SHEWAN-FLETCHER-CRANE
UNITED DRY DOCKS
SHIPBUILDING REPAIRS
11 BROADWAY NEW YORK-DIGBY 0500

UNITED DRY DOCKS

Incorporated

11 Broadway DIGby 0500 New York



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Telephone Cedar 0011 After 5 P. M. Call

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326 Chestnut St., Wyandotte, Mich..... Wyandotte 1154
FRANK M. SCOTTEN, Mechanical Engineer
1450 Elmwood Court, Dearborn, Mich.... Dearborn 447
WILLIAM BRUSH, General Yard Supt.
91 Maple St., River Rouge, Mich.. Cedar 5856-M
JOHN GREIG, Docking Foreman
110 Walnut St., River Rouge, Mich..... Cedar 5558-W
FRED ERNST, Supt. Machine Shops
760 Campbell Ave., Berwalt Manor Apts., Detroit, Mich. ..... Cedar 5644-W
ALLEN TUCKER, Watchman
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R. PEET, Solicitor
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GREAT LAKES ENGINEERING WORKS

Shipbuilders and Engineers

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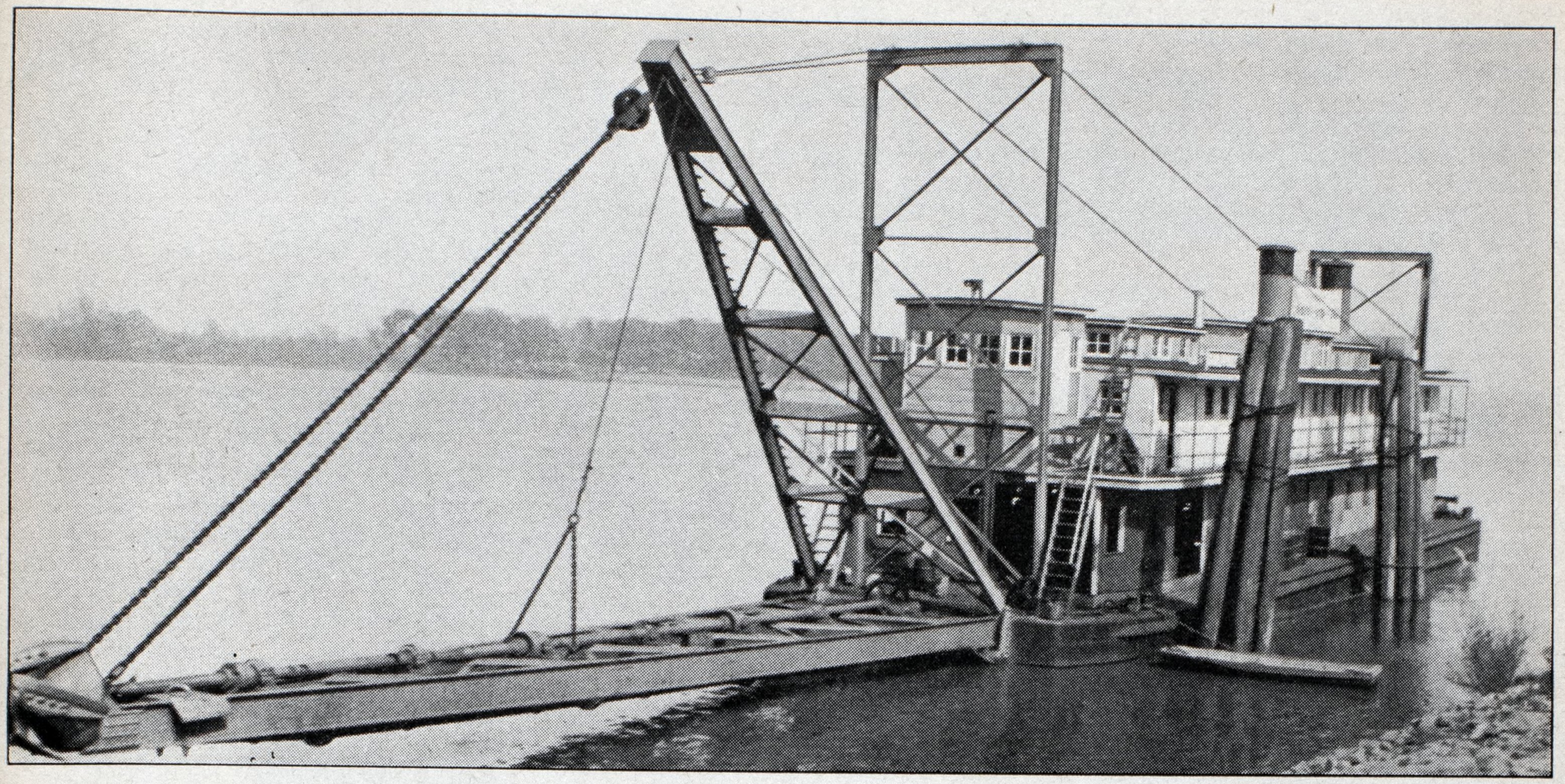
Engine Works Equipped For General Heavy Machine and Foundry Work

Detroit, Michigan

Complete Shipbuilding Dry Dock and Repair Facilities

River Rouge, Mich., and Ashtabula, Ohio

Dredge Gulfport, *owned and operated by McWilliams Dredging Company, Chicago, Ill.* 136 *ft. long,* 30 *ft. beam,* 8 *ft. deep. At present operating on Bonne Carre Spillway,* 20 *miles north of New Orleans, La., between Mississippi River and Lake Ponchartrain, La., under contract from the United States Government. Electric-generator system powered by Type* 4 *mi-*18 *four-cylinder Nelseco Diesel developing* 235 *b.h.p. at* 280 *r.p.m.*



"There's a Nelseco for every need . . ."

A STATEMENT frequently made in Nelseco Diesel engine advertising declares that the range of Nelseco models includes types suitable for every marine requirement. The Nelseco installation on the dredge *Gulfport*, illustrated above, offers an example of the economical and reliable service that a four-cylinder model yields in the important task of generating electricity for lighting systems and auxiliary electric motors.

The *Gulfport*, at present operated by the McWilliams Dredging Company, Chicago, under contract from the United States Government on Mississippi River flood control, is undergoing hard and steady usage. Any breakdown in the lighting system, or failure of current required to operate auxiliary deck gear, would result in suspension of action and heavy loss to the McWilliams company. The Nelseco installation has proved efficient, economical and completely reliable.

Each Nelseco model incorporates the most advanced principles of design and construction of Diesel engines that have been developed to date. The wide range of types makes it possible to exactly fill the requirements of every purchaser. We shall be glad to send you complete information. Write for Catalog MR

ELECTRIC BOAT COMPANY

NEW LONDON SHIP AND ENGINE WORKS, GROTON, CONN., U. S. A.

Original licensees from and collaborators with M. A. N. since 1910

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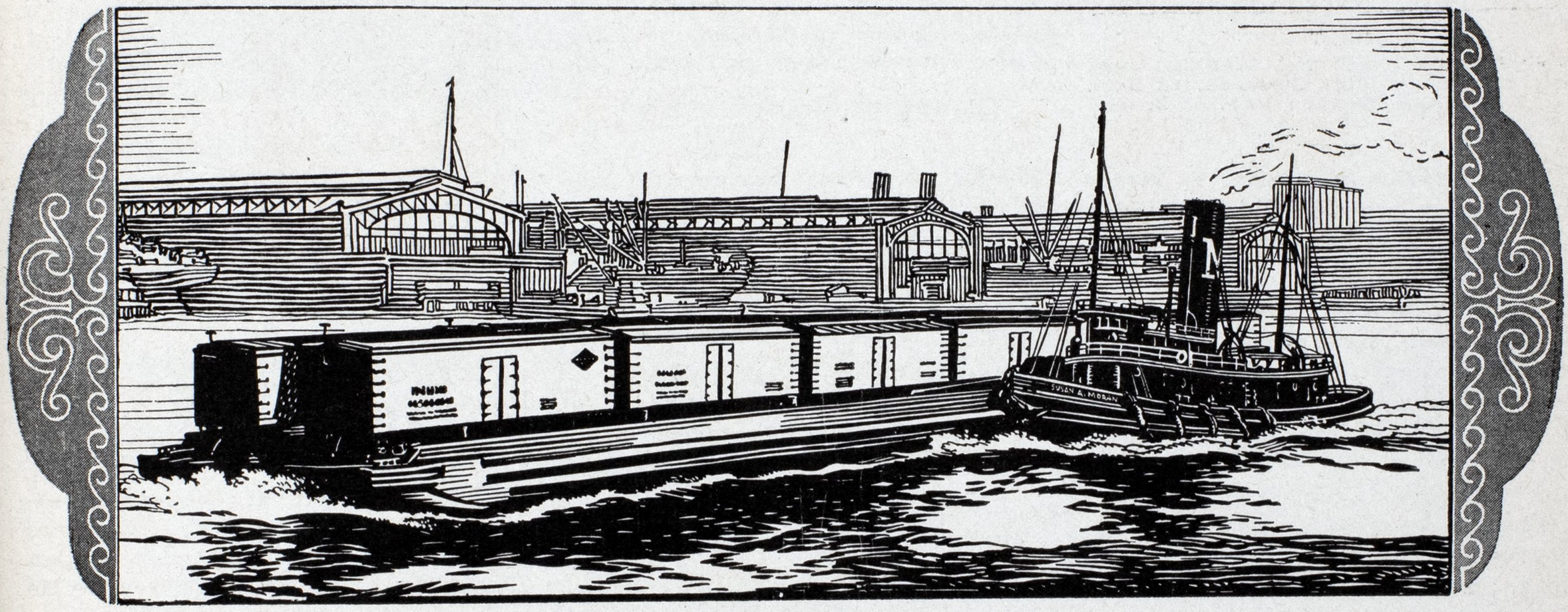
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ELECTRIC BOAT CO. OF MASS.
126 State Street, Boston, Mass.

West Coast Representative
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The Bone and Sinew

CHARACTERISTICALLY and continuedly, through three generations, this Organization has aided in, and been an important part of, the commercial development of the Port of New York. Meeting each new development feature with equal efficiency in both equipment and personnel, Moran Service has earned its place in the very bone and sinew of New York Harbor's industrial activities.



OVER SIXTY-EIGHT YEARS IN SERVICE

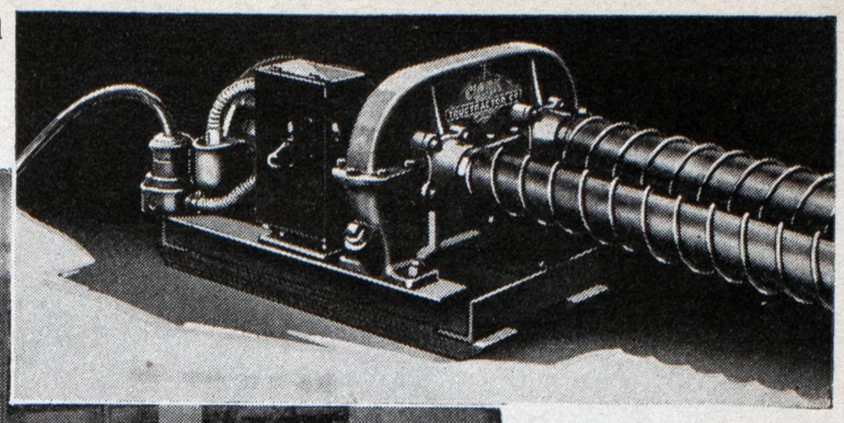
Day and Night Service Every Day and Night in the Year.

A Moran executive is always available

MORAN TOWING AND TRANSPORTATION COMPANY, INC.

17 Battery Place, New York—Whitehall 1340

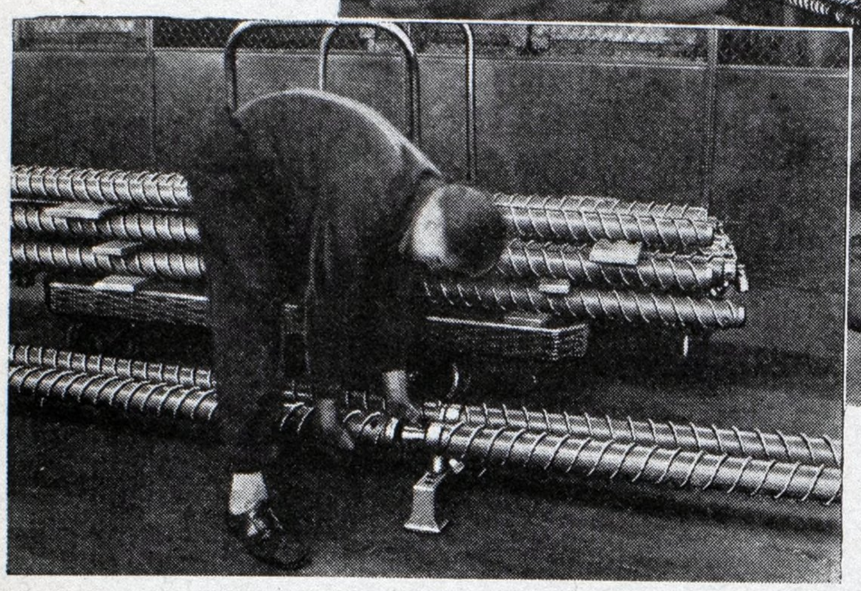
MORAN Service



Plug power head's extension cord into any power line.



Conveying and stacking sugar. Note how sections of TwinVeyor are supported by piles of bags.



Assembled or disassembled one min. per 8-ft. dual section.

Portable—flexible—power driven

CLARK "TWINVEYOR"

—a new and better way to handle cargo

It handles cargo fast and economically. Assembled in 8-ft. dual sections, it's easily shifted with the work. Any section will take a 15 deg. horizontal angle, a 10 deg. drop or a 15 deg. rise. Point the TwinVeyor where you want to shoot the material and up she goes.

In operation, the two external spiral tubes are turned toward each other by the power head. Anything placed on the conveyor travels forward rapidly, smoothly, self-balanced. In the world's largest sugar refinery the TwinVeyor carries bagged sugar up a 30% grade, 90 ft. a min., 1800 bags per hr.

There are countless applications of this equipment in handling cargo—its labor saving performance quickly justifies its low initial cost. Write for special descriptive bulletin.

The Clark Tructractor Co.
Battle Creek, Mich.

Attach this ADVERTISEMENT to your inquiry

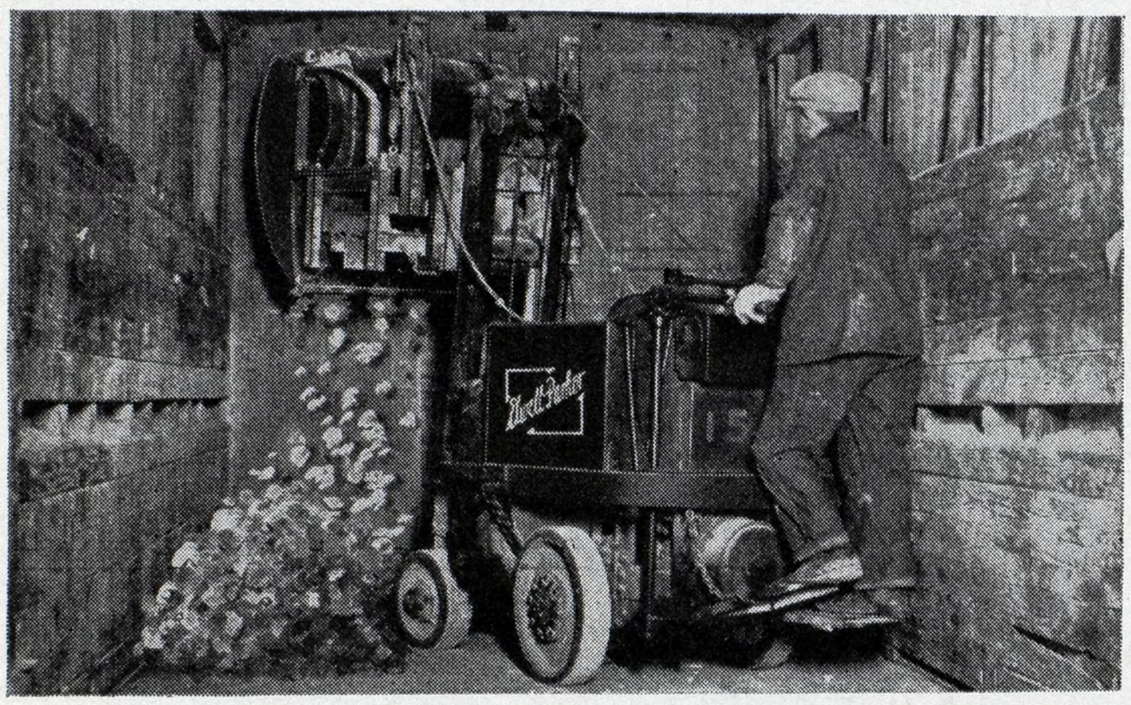
SURE

You Can Handle Bulk Cargo on

ELWELL-PARKER ELECTRIC TRUCKS



Loading truck with clay from stationary hopper



The dumping operation inside box car



The loading operation as it was formerly performed with hand trucks

Here's the way they handle clay at one terminal—and at a saving, too, of 52½ cents per ton.

Ship's gear deposits the clay in a large stationary hopper. Then an Elwell-Parker Electric, of the elevating "chisel" type equipped with hopper in place of chisel, is run into loading position—beneath the stationary hopper.

Clay pours into the truck hopper—and away goes the truck to the waiting box car, elevating the hopper as it travels. Separate travel and lift motors make this time saving operation possible. Inside the car, hopper is tripped and clay is deposited on the floor. As the operation proceeds, the clay is piled to capacity load, *without the aid of a single shoveler.*

Two men, each riding an Elwell-Parker Electric, now perform six times as much work as they were formerly able to do with hand trucks.

Handling sheep manure by the same method resulted in reduced handling cost of 48c *per ton*, while 52c *per ton* was saved on bulk salts.

In any marine terminal, there are scores of jobs that can be performed at big savings with the electric "chisel" truck, developed and perfected by Elwell-Parker.

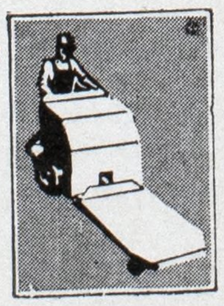
Ask your nearest Elwell-Parker Engineer about this truck. Without obligation, he will show you how it can be used to best advantage in *your* terminal . . . or—we will be glad to send you information direct from the factory in Cleveland.

Oversize motors, heavy in copper, take all the power the battery delivers. No fuses are necessary. Power failure at crucial moments is avoided. This, together with automatic control features protecting operator and truck, will interest your Safety Committee.

The Elwell·Parker Electric Co.

Designers and Builders of Electric Industrial Trucks, Tractors and Cranes for 24 years

SHIP ON SKIDS

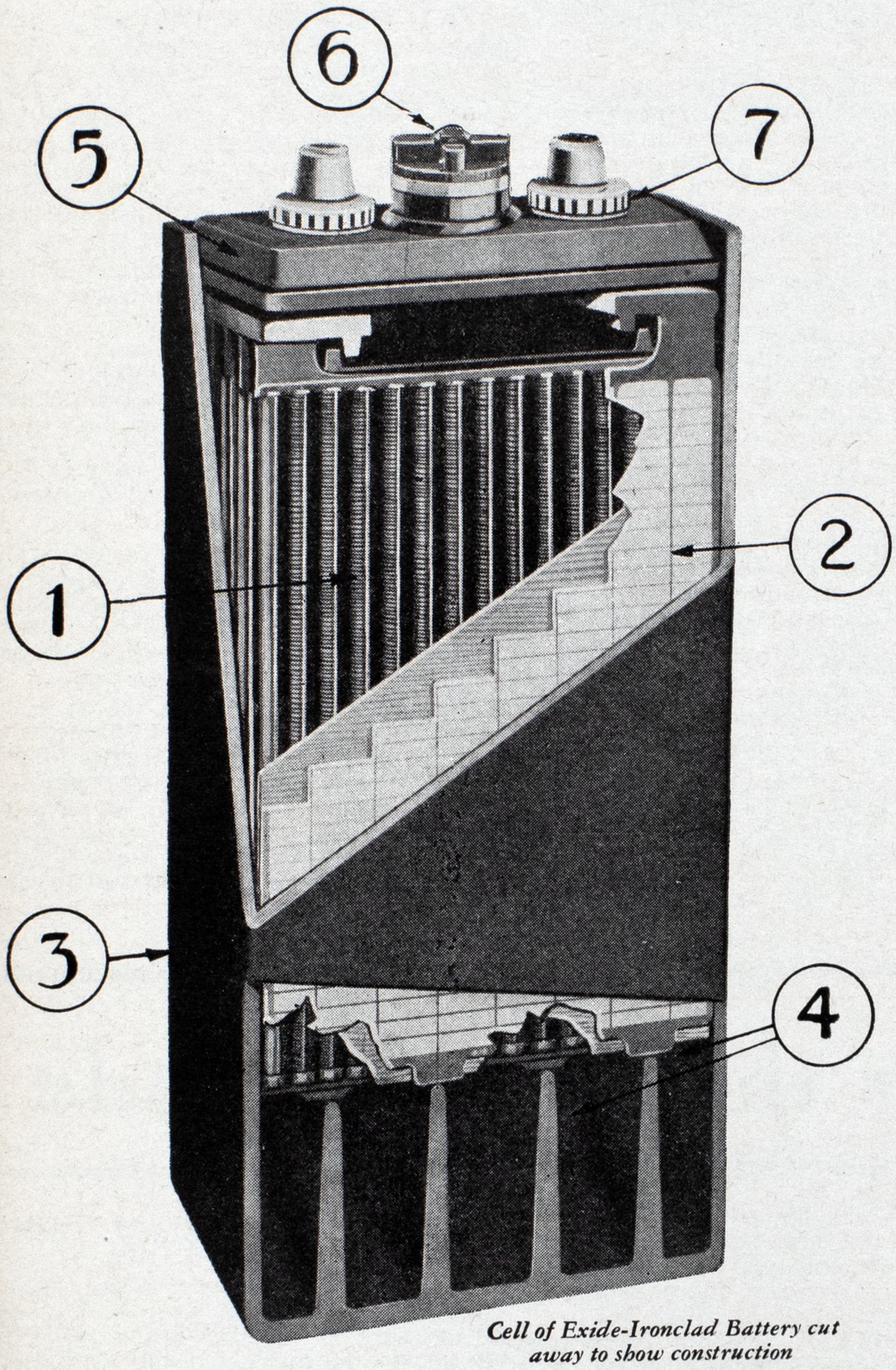


4200 St. Clair Avenue, Cleveland, Ohio

Tructors

Like fish in a net . . . .

That's the way active material is held in Exide-Ironclad Batteries



Cell of Exide-Ironclad Battery cut away to show construction

WHEN the catch is hauled in, the fish struggle in vain to escape from the net, but the water drains away easily. That's very similar to the way the famous Exide-Ironclad Battery operates.

In the Exide-Ironclad the positive plate is composed of finely slotted rubber tubes. These slots are so small that the liquid in the cell can easily reach the active material, but the active material cannot readily escape. Consequently, the Exide-Ironclad Battery has an immense reserve for tough, gruelling work and for an unusually long life.

Seven points of construction that make Exide-Ironclads the outstanding batteries for marine service are—

1 ***The Slotted Tube Construction*** of the Exide-Ironclad positive plate greatly prolongs the life of this sturdy battery.

2 ***The Exide Negative Plate,*** carefully constructed to match the *durability* of the positive plate.

3 ***The Extra Rugged Jar,*** of hard rubber—a natural insulator, in which the battery elements are assembled.

4 ***The High Ribs*** in the bottom of the jar provide ample sediment space so that *internal cleaning is unnecessary.*

5 ***Sealed Cell Cover*** of hard rubber prevents any sloppage of electrolyte which might result from the pitching and rolling of the ship.

6 ***A Specially Designed Vent Plug*** prevents the escape of electrolyte spray. This enables the battery to be close to other mechanical apparatus.

7 ***Grease Ring Seal Nuts*** hold the battery elements securely in place and prevent creepage of electrolyte, keeping tops of cells clean and dry.

THE EXIDE MARINE FLOATING BATTERY SYSTEM

EXIDE-IRONCLADS are operated in a manner new to the fishing industry . . . they can be floated in one series across the main bus with suitable generator adjustment. This enables the battery to function *automatically and instantly* in case of emergency . . . generator failure. The battery also absorbs peak loads on the generator, thus avoiding, to a large extent, fluctuating lights. The generators automatically charge the battery whenever they are in operation. Thus Exides are ready at all times to meet your vessel's every electrical need; to give perfect service steadily, reliably and economically.

Exide
IRONCLAD
BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

THE WORLD'S LARGEST MANUFACTURERS OF STORAGE BATTERIES FOR EVERY PURPOSE

Exide Batteries of Canada, Limited, Toronto

Modern Steam

Illustrated by sister-ships operating on same route

The S. S. Virginia of the Panama Pacific Line uses Modern Steam at 300 pounds pressure and 200° F. superheat. A sister ship, the S. S. California, using steam at a slightly lower pressure and temperature, requires about 7% more fuel oil per shaft horsepower per hour when operating over the same route. Expressed another way the S. S. Virginia uses 110 tons less fuel per round voyage, has lower investment in machinery and consequently lower fixed charges for propulsion equipment than the S. S. California.

Both vessels might be classed as users of Modern Steam, but the comparative performance is interesting in that it shows the possibilities of higher steam pressures and temperatures.

S. S. California. Built, 1927. 275 pounds steam pressure. 100° F. superheat. .76 pounds of fuel per S.H.P.

These ships are both equipped with Babcock & Wilcox Water Tube Boilers, Superheaters, Feed-water Regulators, Oil Burners and B. & W. No. 80 Firebrick.

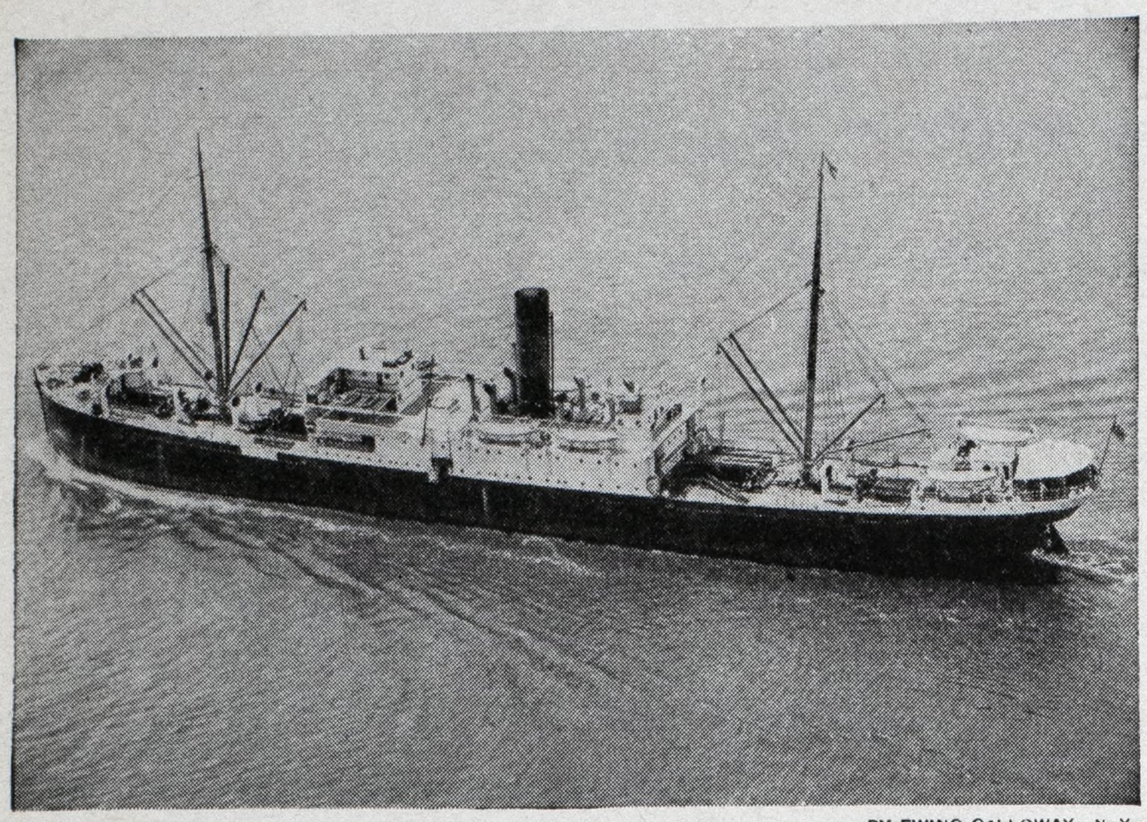
S. S. Virginia. Built, 1928. 300 pounds steam pressure. 200° F. superheat. .70 pounds of fuel per S.H.P.



THE
BABCOCK & WILCOX
COMPANY

85 LIBERTY ST. NEW YORK, N. Y.

THIS FLEET is our Peacetime Protection



BY EWING GALLOWAY, N.Y.

An American freighter steaming into New York

"MARKETS—more markets," is the cry of America's industries. Volume outlets must be opened to keep up present production schedules and continue our prosperity. With domestic markets glutted, the answer lies overseas—in new foreign markets, and ready access to them.

The markets are there—are being broadened by the United States Shipping Board's establishment of world-wide trade routes. And access to them is amply provided by the new American Merchant Marine—a mighty fleet made up of the hundreds of speedy, modern American-flag ships in the 16 lines owned by the United States Shipping Board and the many other lines developed by the Shipping Board but now privately owned.

No matter what you make, these American-flag vessels can carry your products safely, swiftly, economically to new markets. The experienced American operators of the lines listed here will be glad to show you how these ships can aid your business. Write for full information.

★ ★ ★

*AMERICA FRANCE LINE
*AMERICAN BRAZIL LINE
*AMERICAN DIAMOND LINES
DIXIE UK LINE
*AMERICAN PIONEER LINE
DIXIE MEDITERRANEAN LINE
MISSISSIPPI VALLEY
EUROPEAN LINE
YANKEE LINE
MOBILE OCEANIC LINE
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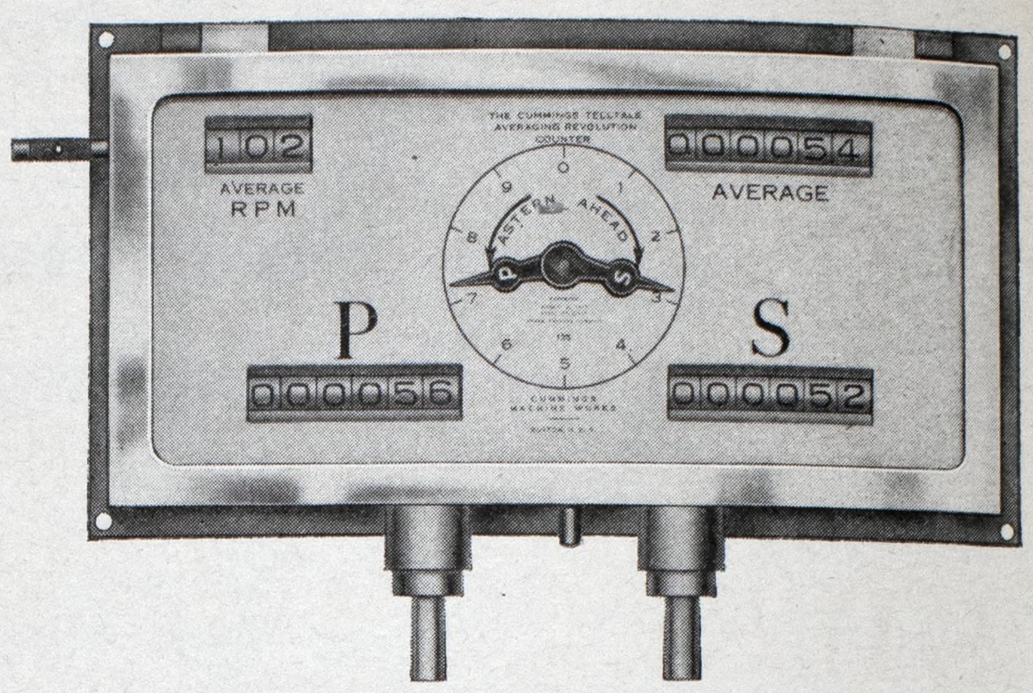
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An American freighter unloading raw sugar from an American-owned plantation. This is typical of the way the 16 Shipping Board lines help make profitable the foreign investment of American capital.

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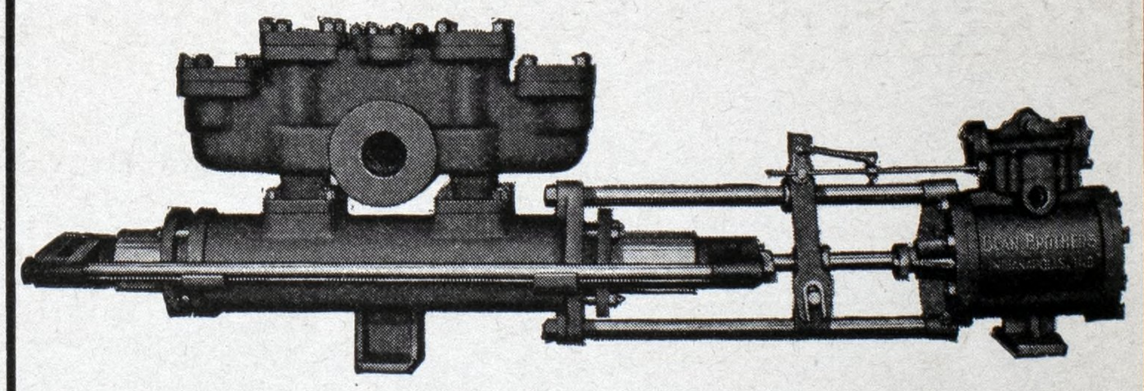


Figure No. 2311 Horizontal Single Style Double Acting Outside End Packed Plunger Trombone Pot Valve Pump For Boiler Feed & Pressure Service.

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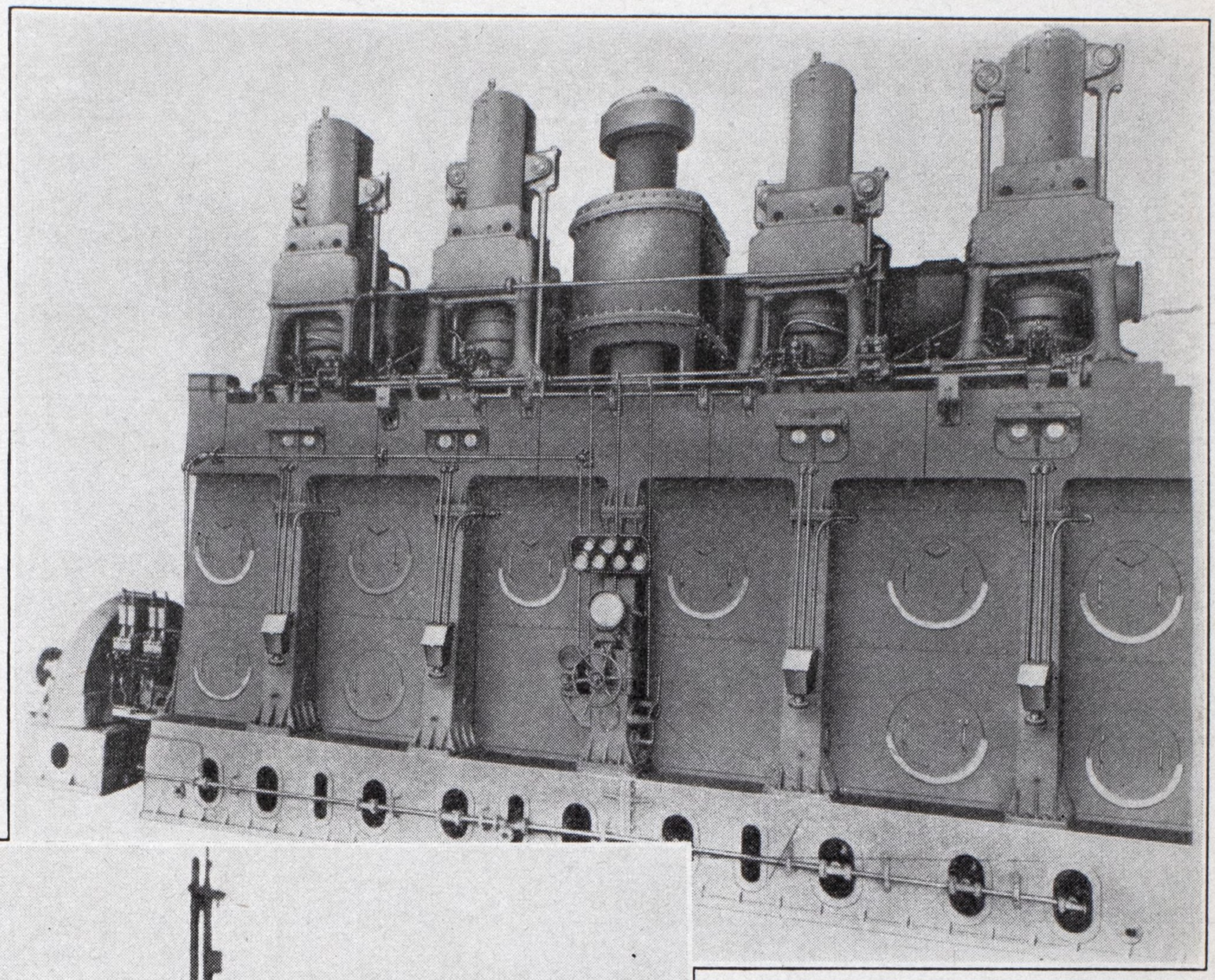
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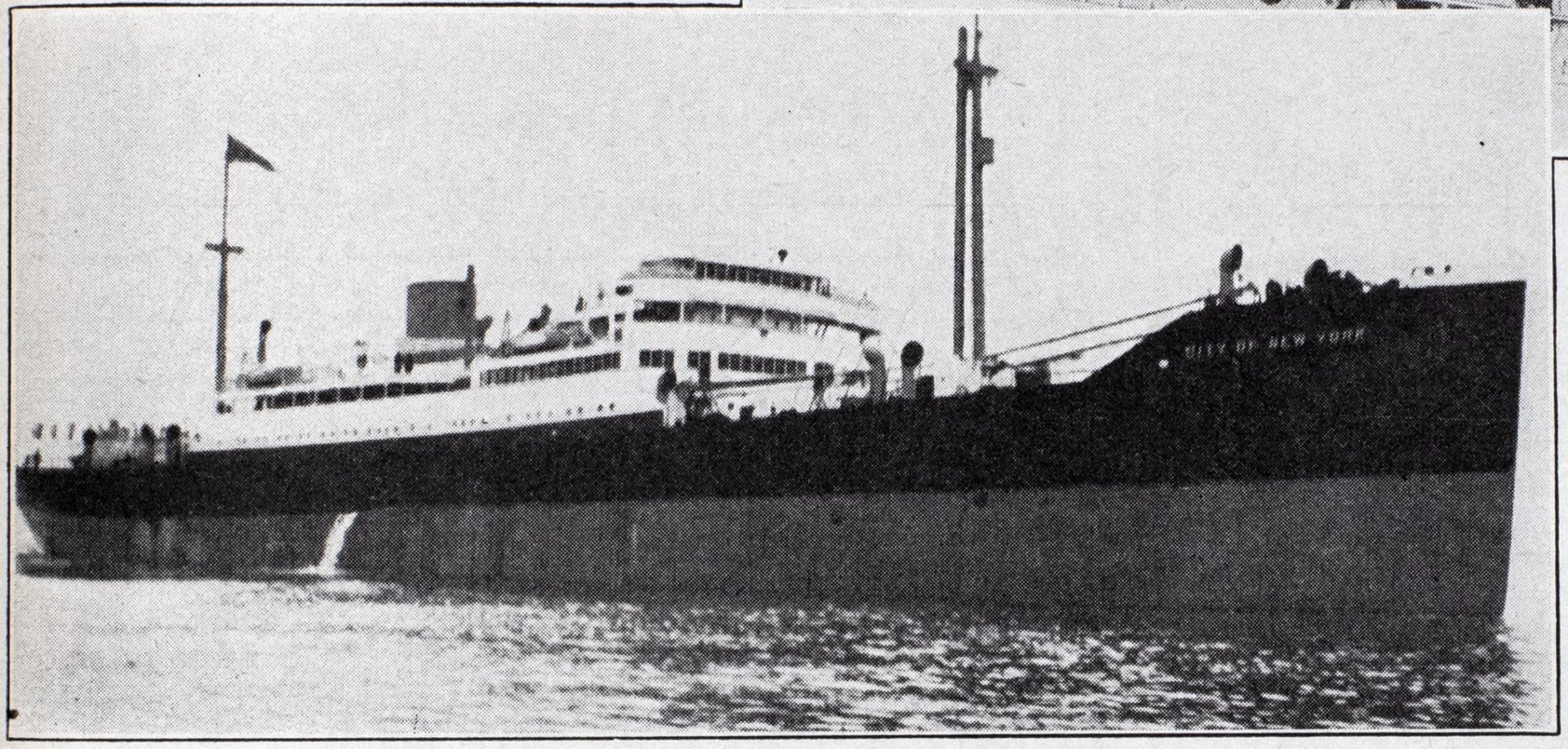
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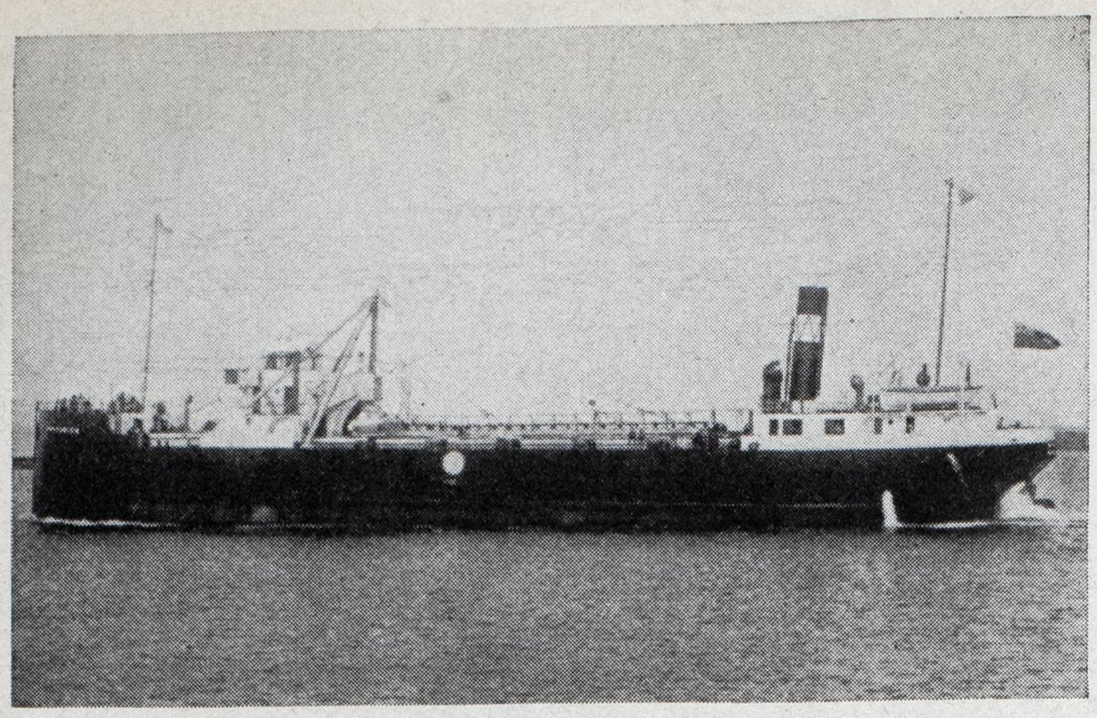
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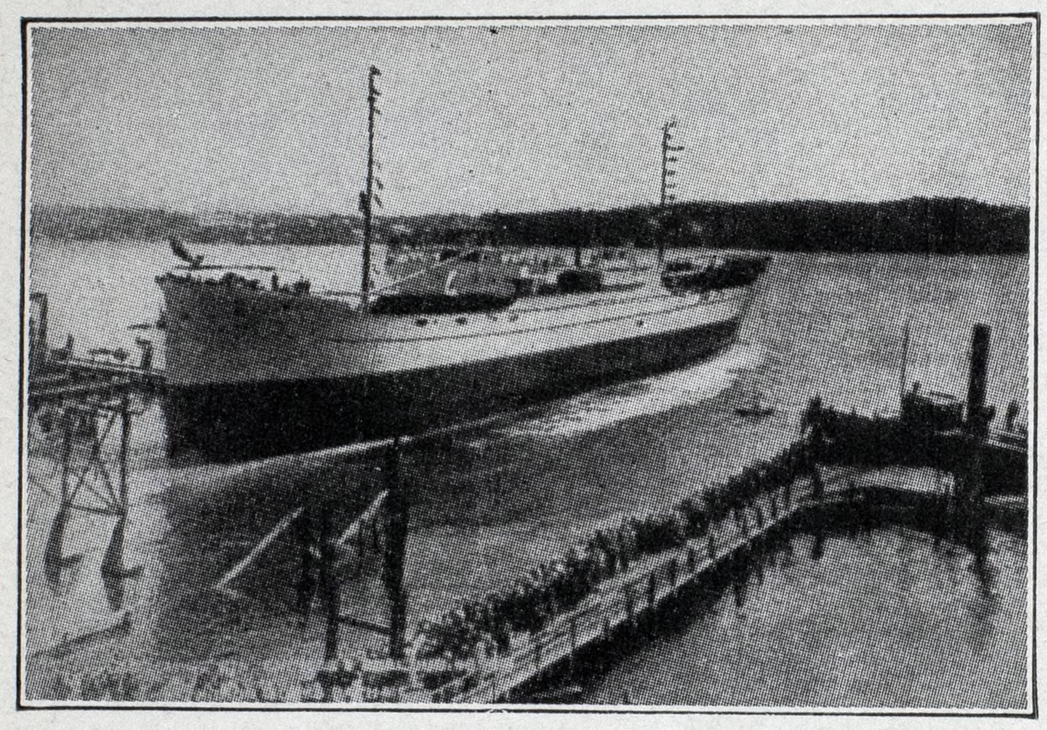
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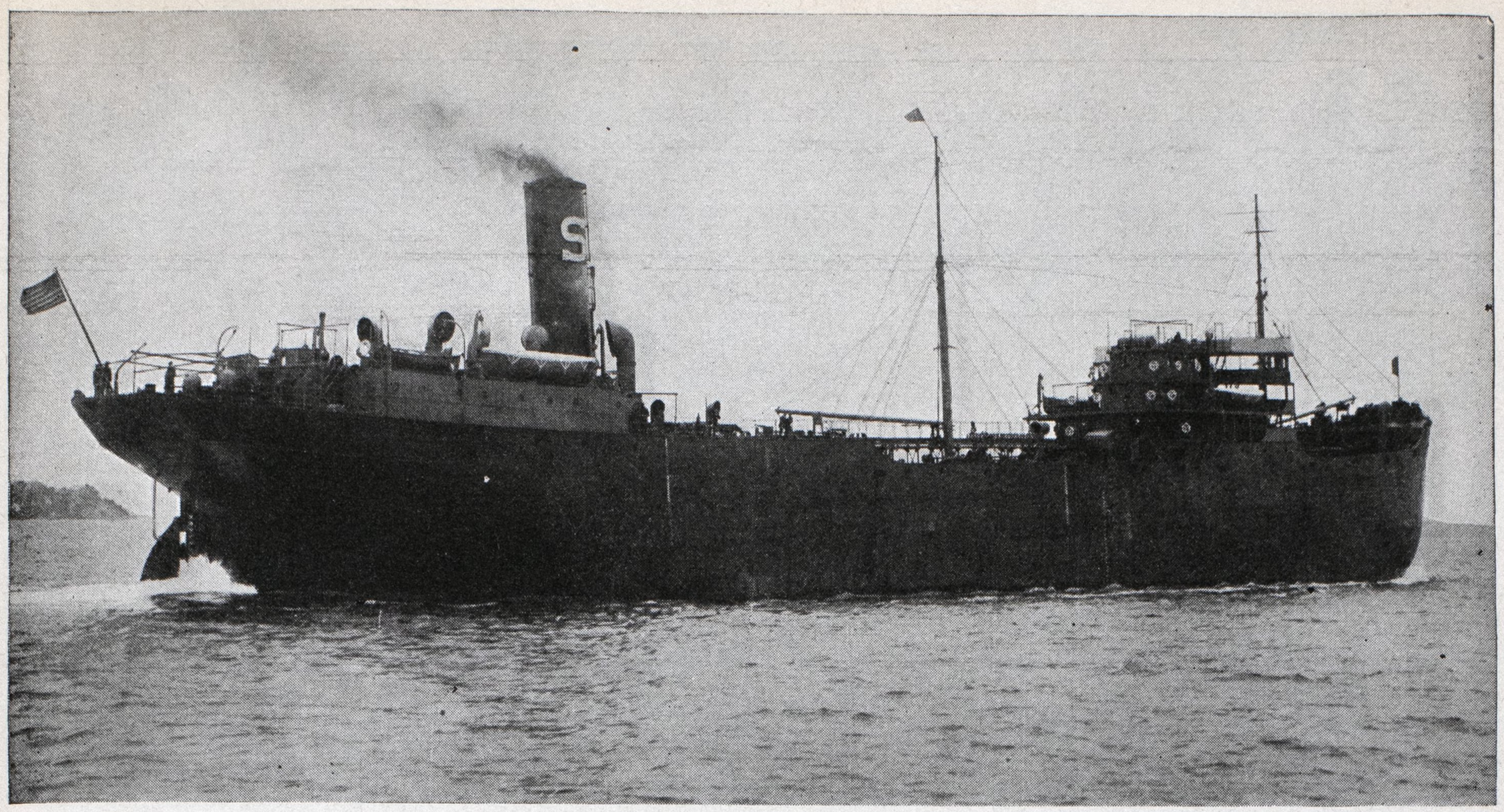
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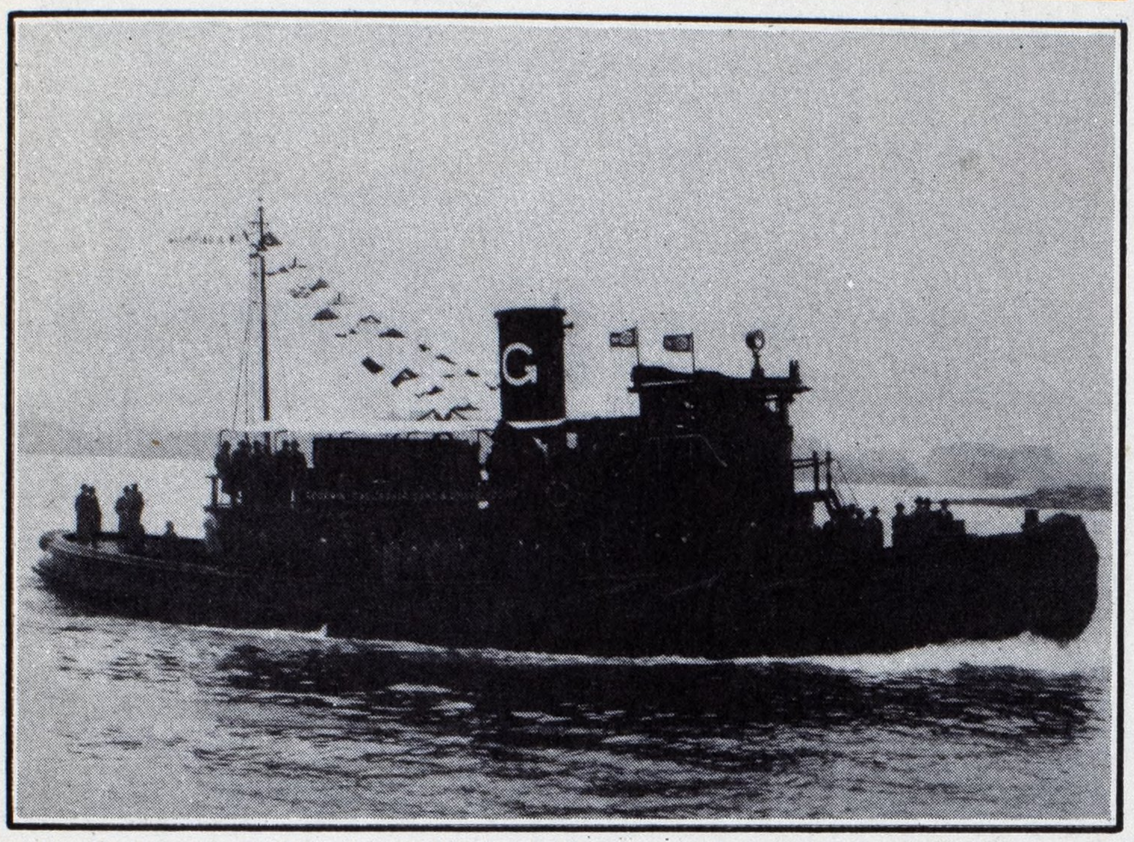
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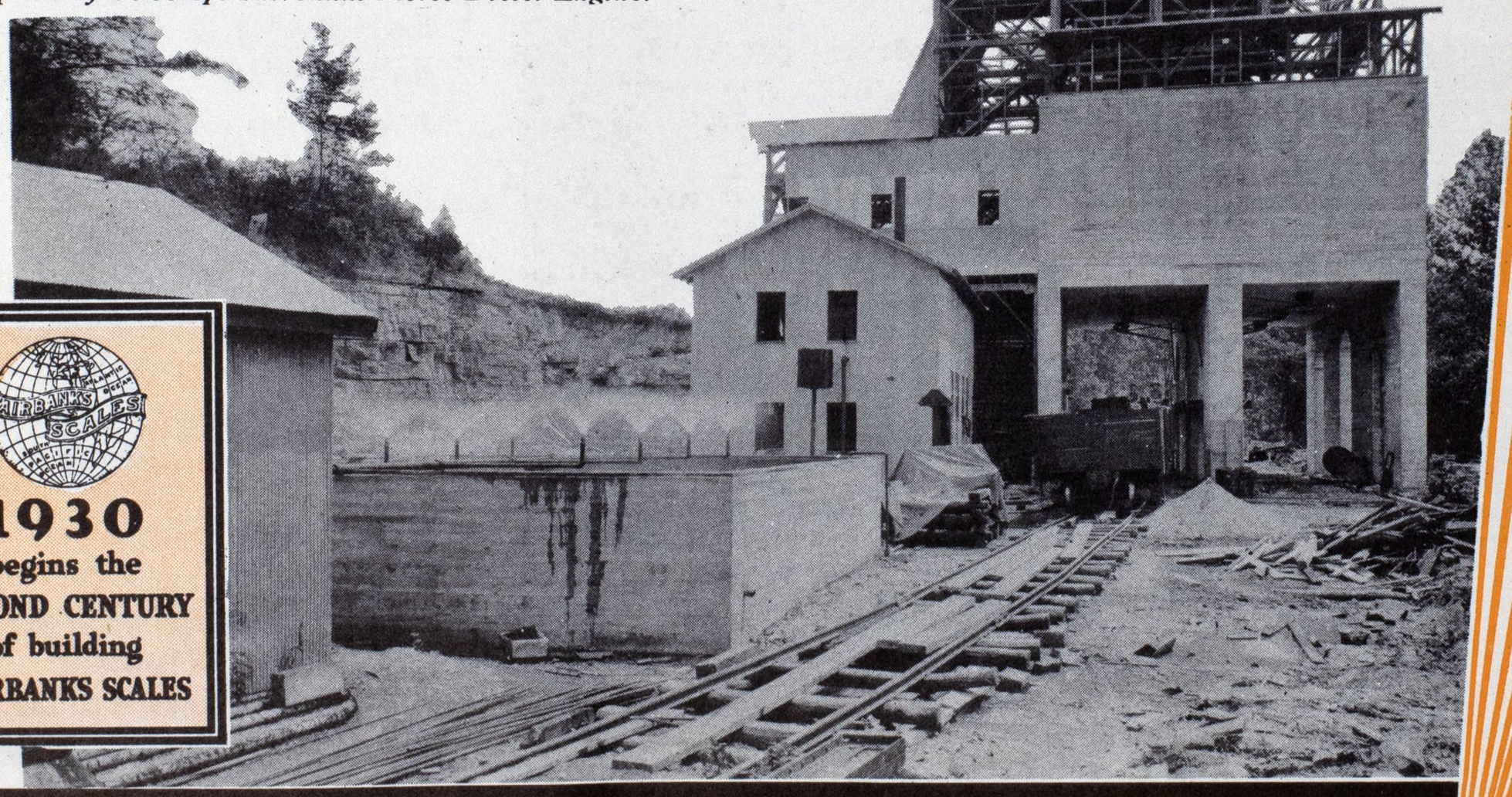
The "John J. Gallagher" is the fifth tug to be equipped with an F-M Diesel Engine by the Goodwin-Gallagher Corporation, one of the largest producers of sand and gravel in New York. A 700 hp. Fairbanks-Morse Marine Diesel is used in this craft.

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Fairbanks-Morse Diesel economy is available for an almost limitless range

{Continued on next page}

Crushing plant of the Sunbeam Quarries at Clermont, Ky. Power is supplied by a 560 hp. Fairbanks-Morse Diesel Engine.



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FAIRBANKS-MORSE
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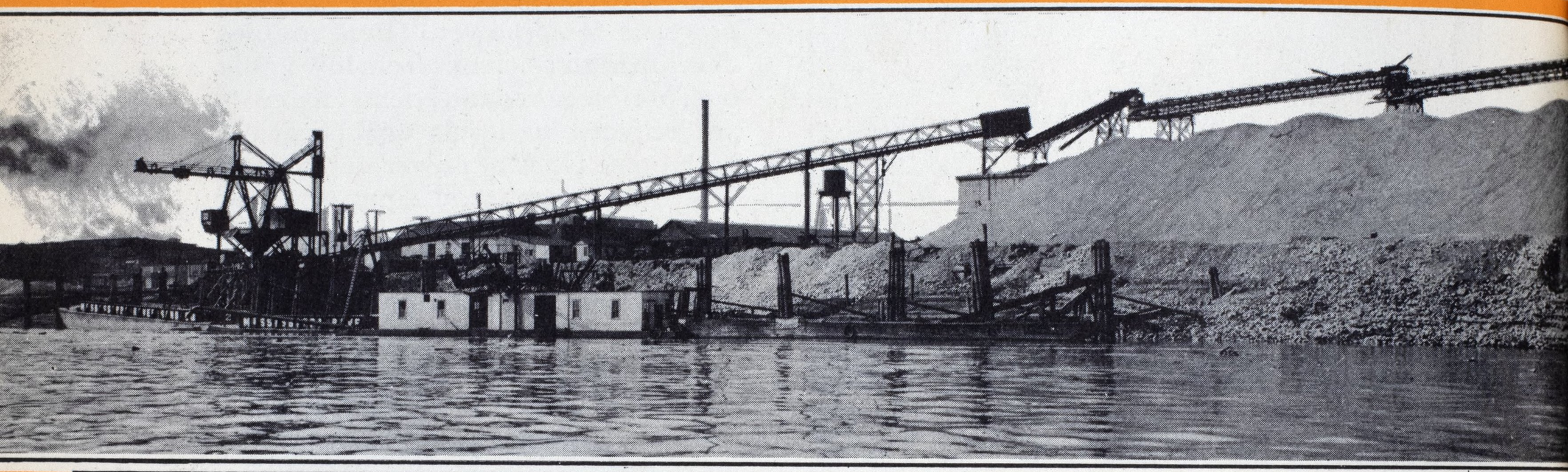
POWER, PUMPING AND WEIGHING EQUIPMENT

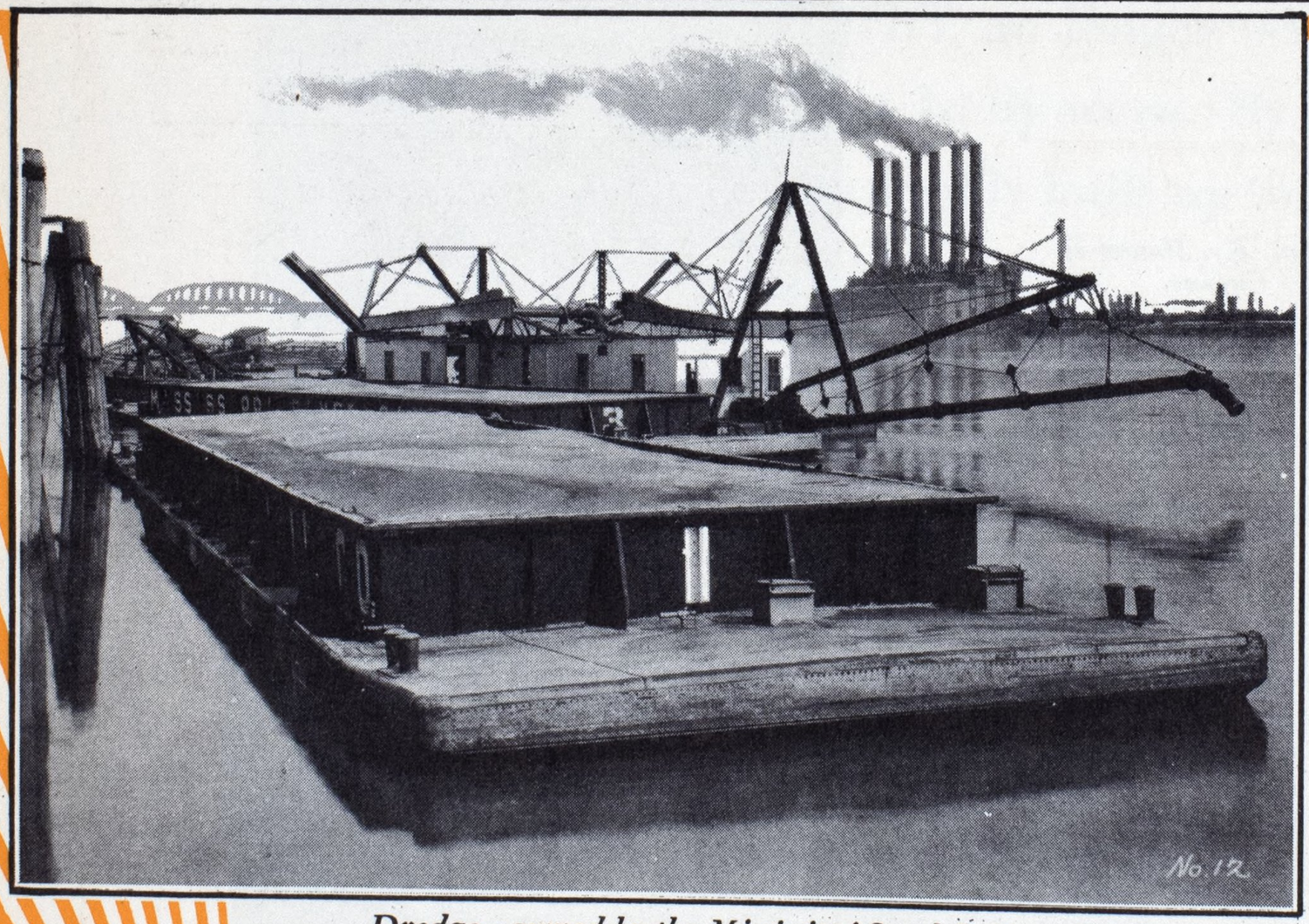
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of applications. The operating characteristics of these engines make them adaptable to nearly every marine and stationary power requirement. As the complete line of Fairbanks-Morse Diesels—stationary and marine—includes models ranging from 25 to 1200 horsepower, an engine can be selected that will fit any particular requirement exactly.



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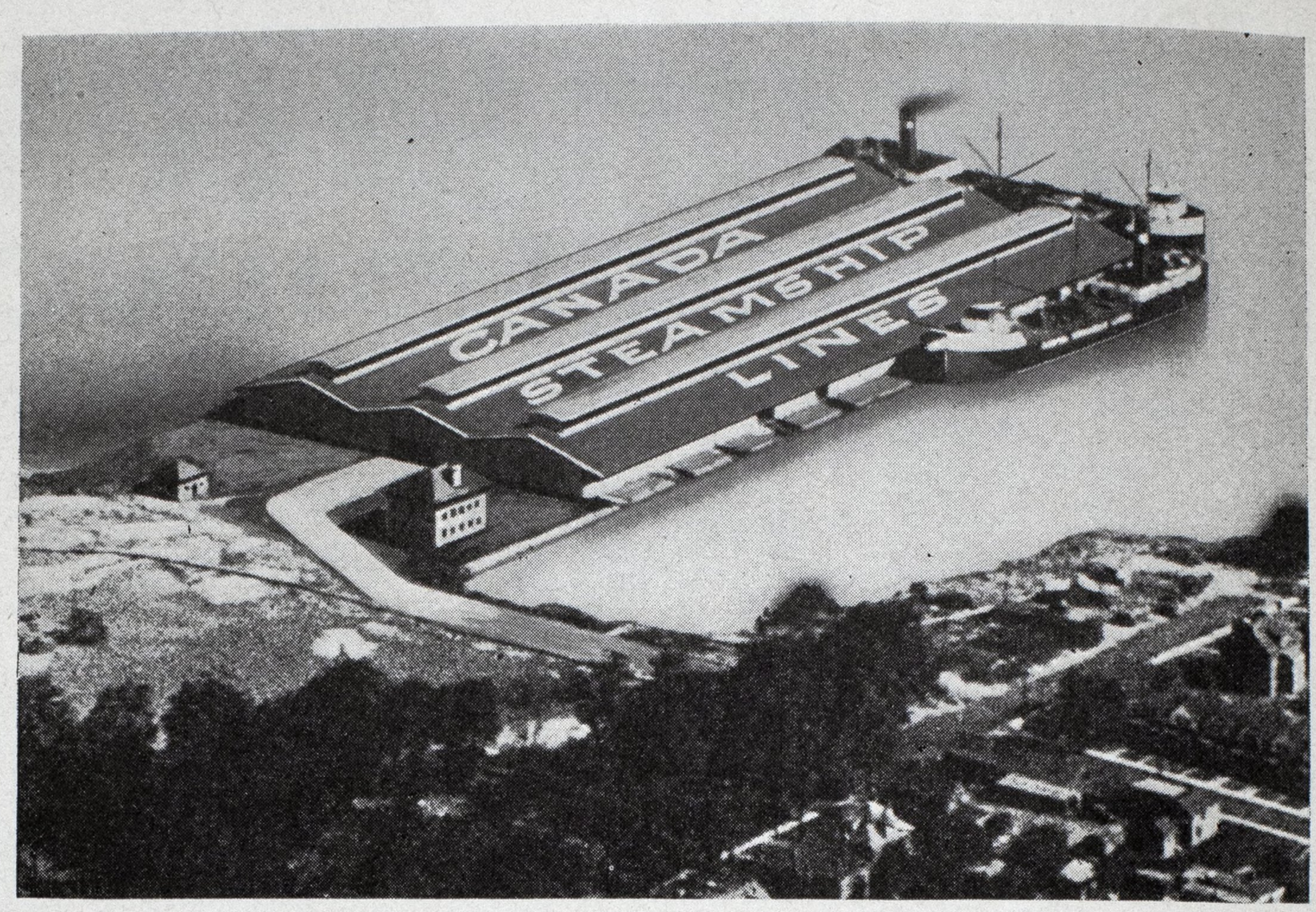
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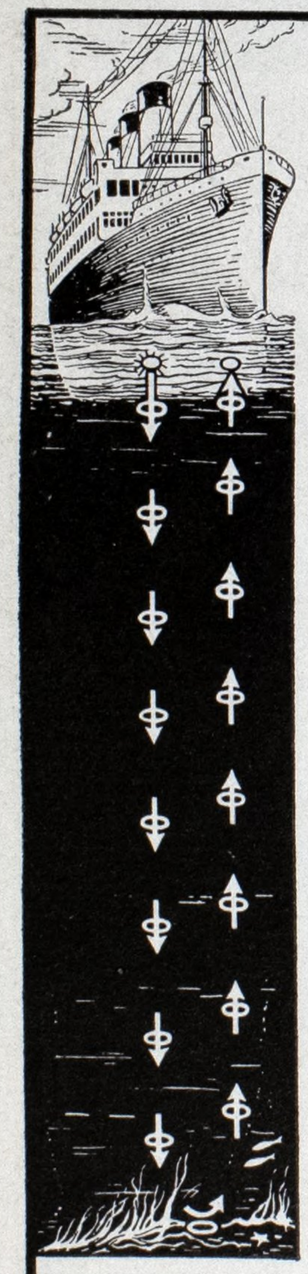
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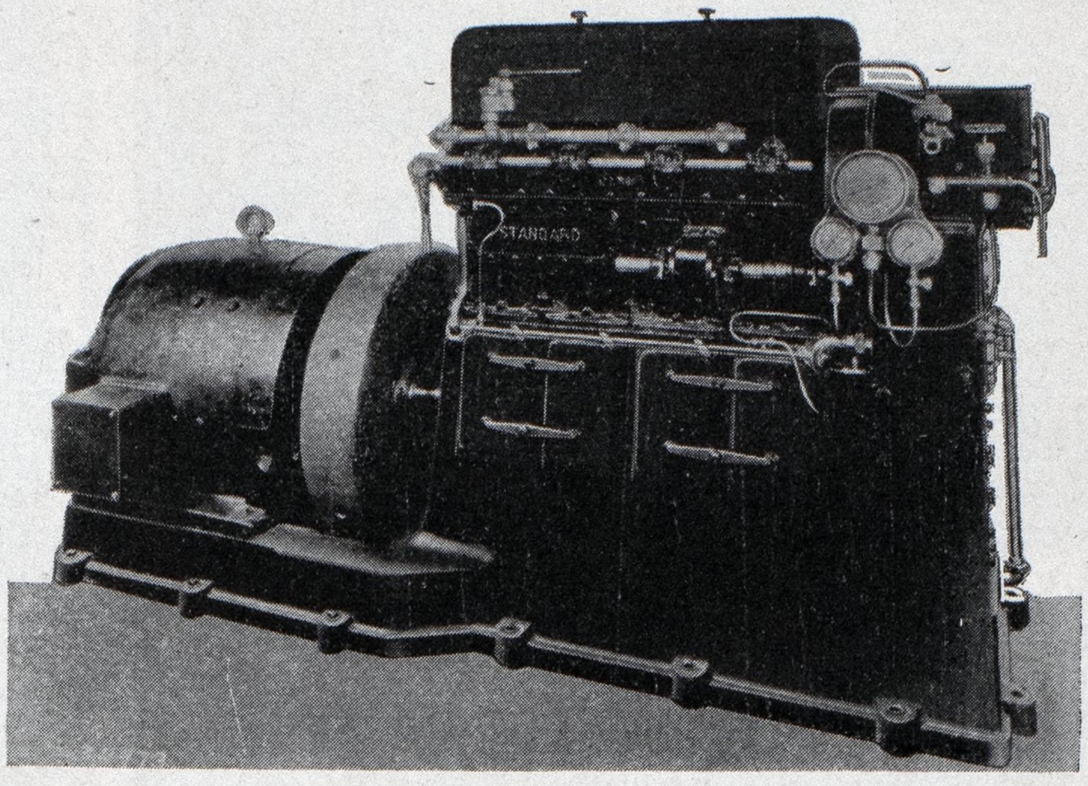
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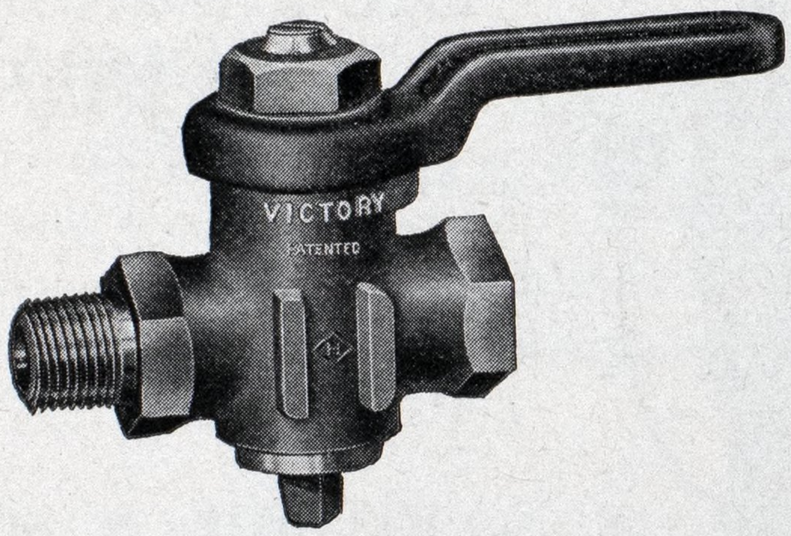


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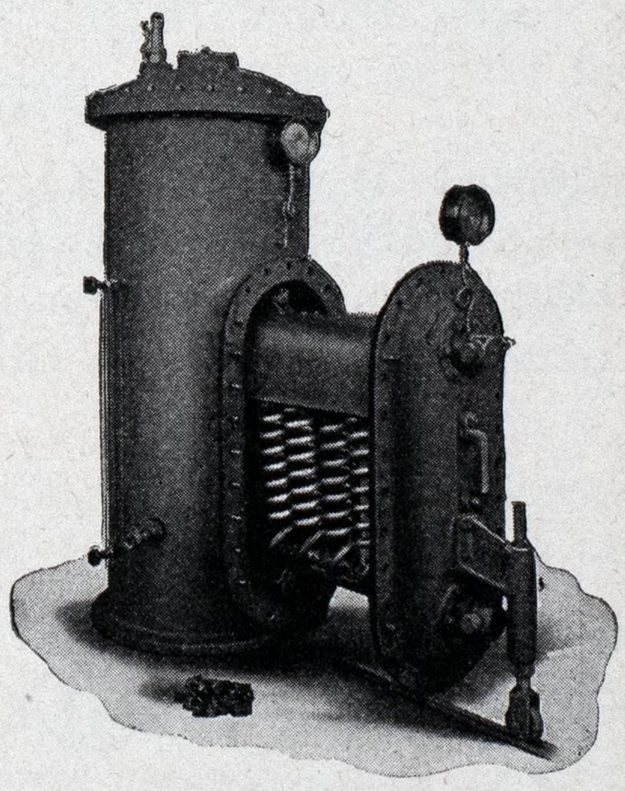
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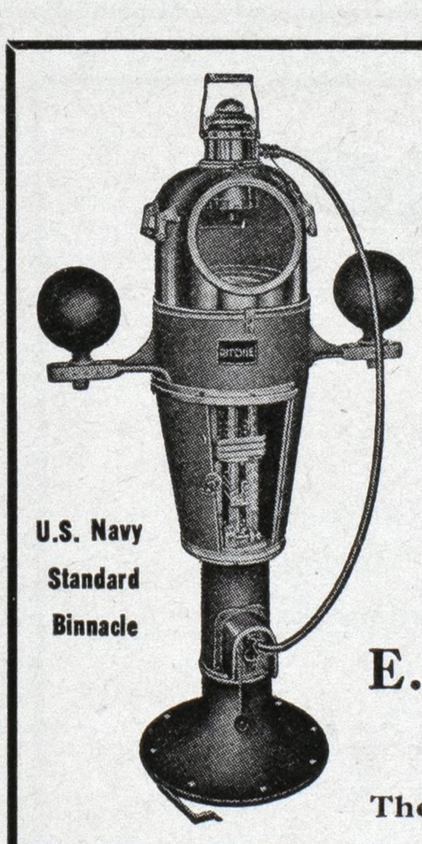
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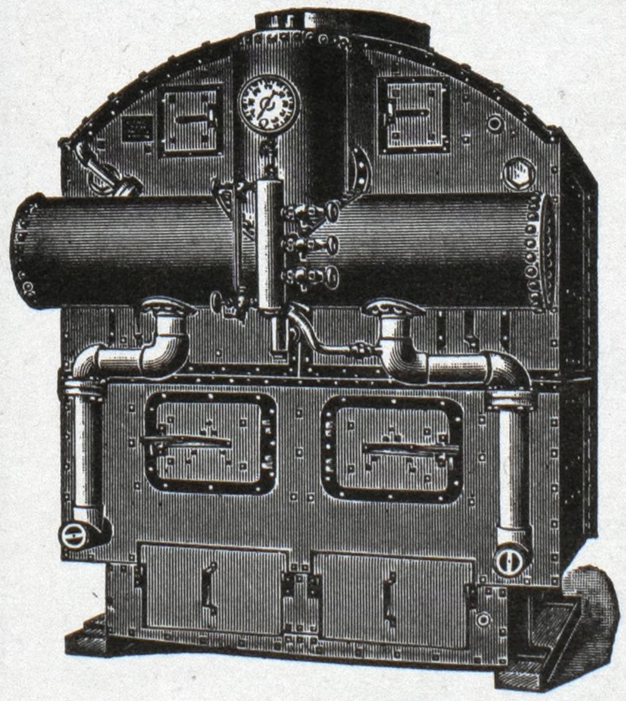
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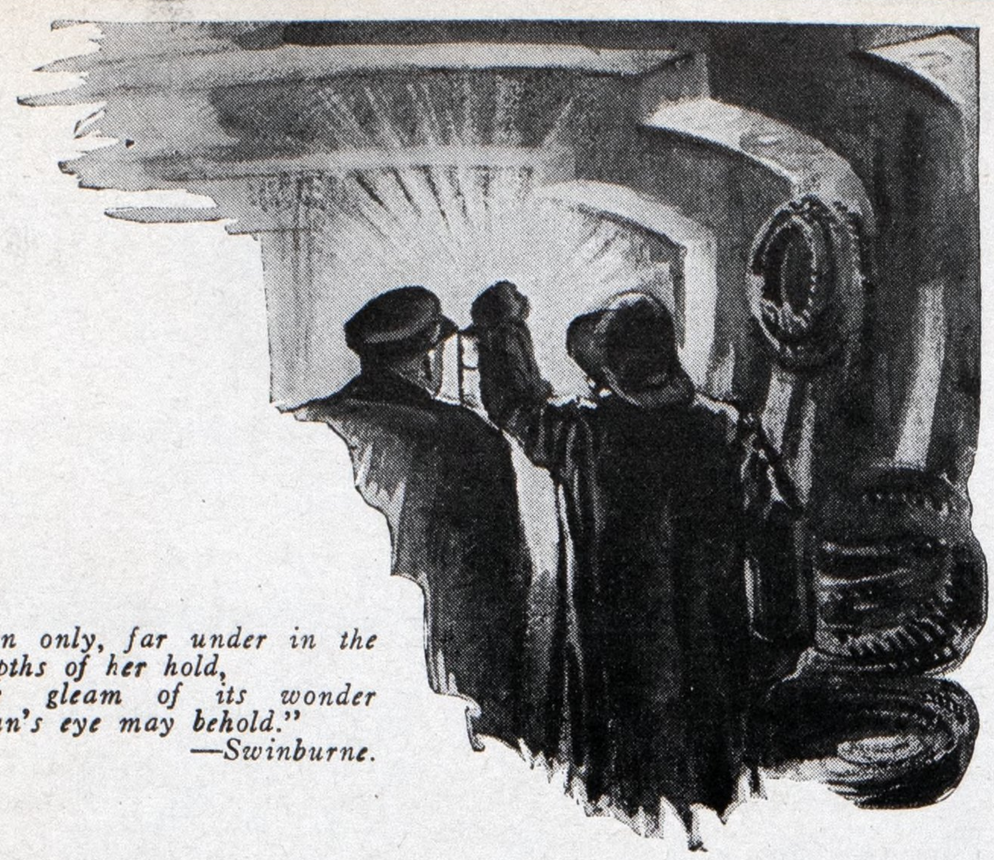


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Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Dake Engine Co.,
Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

CAR FLOATS
American Bridge Co.,
71 Broadway, New York City.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.

CARBIC
Union Carbide Sales Co.,
30 E. 42nd St., New York City

CARBIC FLOODLIGHTS
Oxweld Acetylene Co., The,
30 E. 42nd St., New York City

CARBIDE
Union Carbide Sales Co.,
30 E. 42nd St., New York City

CASTINGS
Great Lakes Engineering Works,
River Rouge, Mich.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.
Standard Motor Construction Co.,
172 Whiton St.,
Jersey City, N. J.

CASTINGS (Iron)
Busch-Sulzer Bros.-Diesel Engine Co.,
2nd and Utah Sts., St. Louis, Mo.

COMBINATION COUNTER AND TELLTALE
Cummings Machine Works,
255 Atlantic Ave., Boston, Mass.

COMPASSES
Ritchie, E. S., & Sons,
Brookline, Mass.

COMPASSES (Gyro)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

COMPRESSORS
Brunswick-Kroeschell Co.,
New Brunswick, N. J.

CONDENSERS
Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.
Great Lakes Engineering Works,
River Rouge, Mich.
Ingersoll-Rand Co.,
11 Broadway, New York City
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

CONTRAPROPELLER
Collingwood Shipyards, Inc.,
Collingwood, Ont., Canada.

CONTRARUDDER
Collingwood Shipyards, Inc.,
Collingwood, Ont., Canada.

CONTROLLERS (Electric)
Cutler-Hammer, Inc.,
1265 St. Paul Avenue,
Milwaukee, Wis.

CONVEYORS (Portable)
Clark Tructractor Co.,
Battle Creek, Mich.

CORDAGE
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works,
Boston, Mass.
Whitlock Cordage Co.,
46 South St., New York City.

CRANKSHAFTS
Erie Forge Co.,
15th & Cascade Sts., Erie, Pa.

CUTTING APPARATUS (Oxy-Acetylene, Oxy-Gas)
Oxweld Acetylene Co., The,
30 E. 42nd St., New York City

DAVITS
Welin Davit & Boat Corp.,
3-5 Vernon Ave.,
Long Island City, N. Y.

DECKING COVERING
Selby, Battersby & Co.,
33rd & Arch Sts., Philadelphia.

DEPTH FINDERS
Submarine Signal Co.,
160 State St., Boston, Mass.

DIESEL ENGINES—See ENGINES (Diesel)

DIESEL FUEL OIL—See FUEL OIL

DISSOLVED ACETYLENE
Prestolite Co., The, Inc.,
30 E. 42nd St., New York City

DISTILLING APPARATUS
Griscom-Russell Co.,
285 Madison Ave., New York City.

DIVING APPARATUS
Morse, Andrew J., & Son, Inc.,
221 High St., Boston, Mass.

DRAFT (Artificial and Mechanical for Boilers)
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Great Lakes Engineering Works,
River Rouge, Mich.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.

DREDGING MACHINERY
Great Lakes Engineering Works,
River Rouge, Mich.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

DRINKING FOUNTAINS
Haydenville Co., The,
Haydenville, Mass.

DRY DOCKS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Great Lakes Engineering Works,
River Rouge, Mich.
Manitowoc Ship Building Corp.,
Manitowoc, Wis.
Maryland Dry Dock Co.,
Baltimore, Md.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.
New York Shipbuilding Co.,
Camden, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.
Todd Shipyards Corp.,
25 Broadway, New York City.
Toledo Shipbuilding Co., Toledo, O.

DYNAMOS
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

ECONOMIZERS
Babcock & Wilcox Co., The,
85 Liberty St., New York City.

EJECTORS (Ash)
Great Lakes Engineering Works,
River Rouge, Mich.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

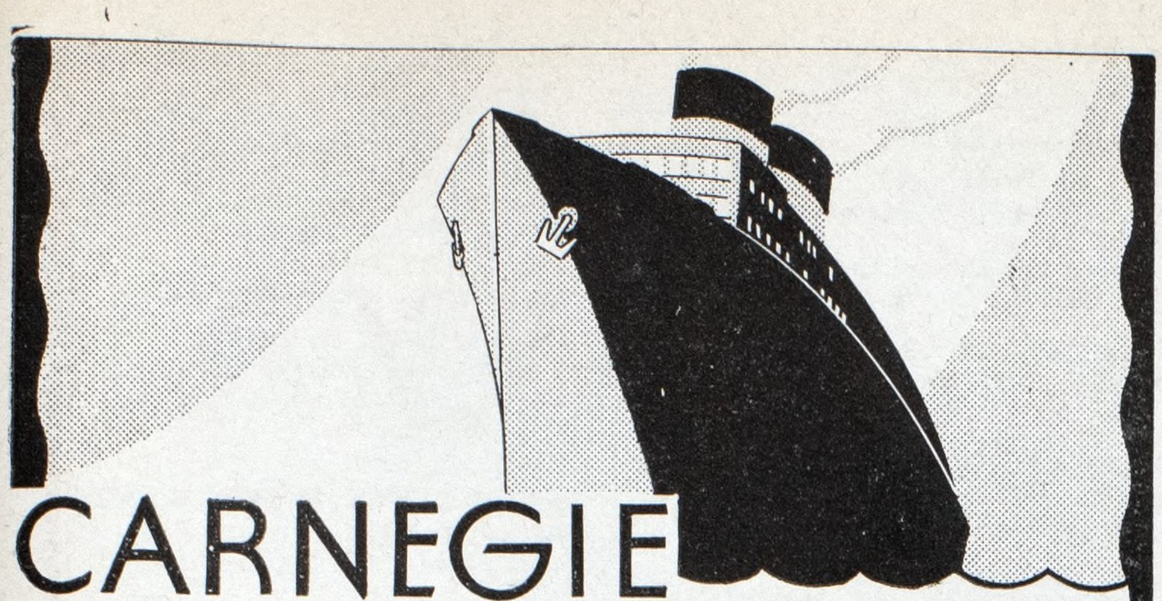
ENGINE SPEED INDICATORS
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

ENGINEERS (Marine, Mechanical and Consulting)
Canada Steamship Co.,
P. O. Box 2430, Montreal, Can.
Crandall Engineering Co.,
Cambridge, Mass.
Great Lakes Engineering Works,
River Rouge, Mich.
Todd Shipyards Corp.,
25 Broadway, New York City.
United Dry Docks, Inc.,
11 Broadway, New York City.

ENGINES
Busch-Sulzer Bros.-Diesel Engine Co.,
2nd and Utah Sts., St. Louis, Mo.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Electric Boat Co.-New London Ship & Engine Works, 247 Park Ave.,
New York City.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Standard Motor Construction Co.,
172 Whiton St.,
Jersey City, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.

ENGINES (Diesel)
Busch-Sulzer Bros.-Diesel Engine Co.,
2nd and Utah Sts., St. Louis, Mo.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Electric Boat Co.-New London Ship & Engine Works, 247 Park Ave.,
New York City.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Ingersoll-Rand Co.,
11 Broadway, New York City
Standard Motor Construction Co.,
172 Whiton St.,
Jersey City, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.

ENGINES (Internal Combustion)
Busch-Sulzer Bros.-Diesel Engine Co.,
2nd and Utah Sts., St. Louis, Mo.
Cooper-Bessemer Corp., The,
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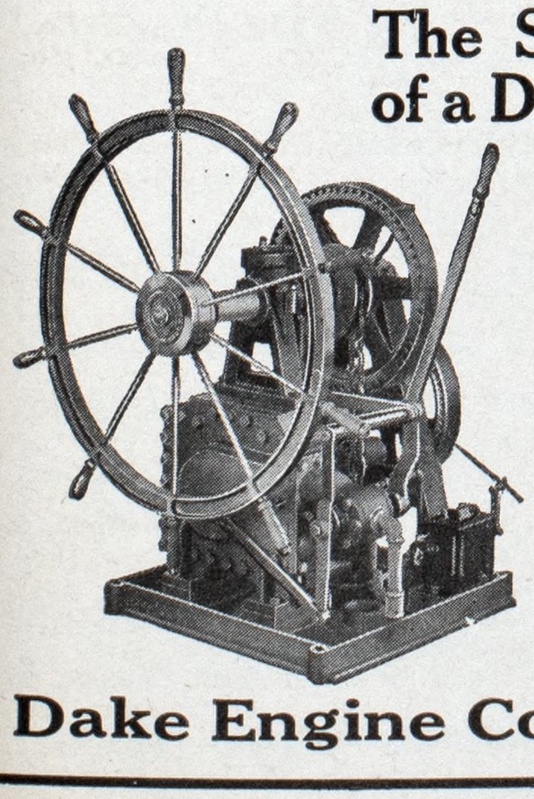
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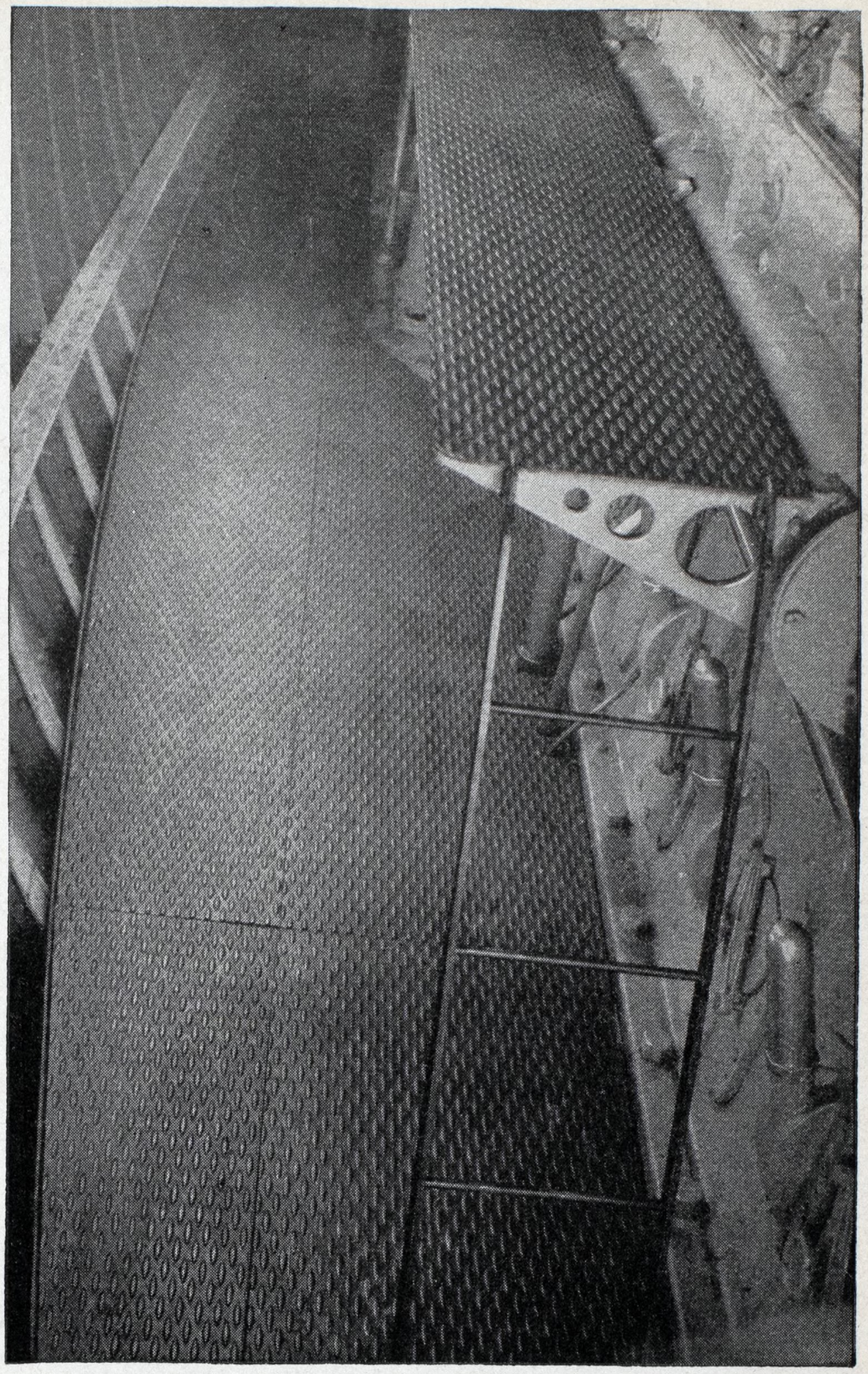
The Dake engine has no dead center; it is always alert, and starts instantly in either direction. This insures easier, quicker and better handling of your boat and saves time, coal and accidents.

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The raised pattern of oval-shaped, bevel-edged and rounded-top diamonds gives the walker confidence and prevents side-slipping with the roll of the ship.

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Bethlehem Shipbuilding Corp.,
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Busch-Sulzer Bros.-Diesel Engine Co.,
2nd and Utah Sts., St. Louis, Mo.
Canada Steamship Lines,
P. O. Box 2430, Montreal, Can.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Electric Boat Co.-New London Ship & Engine Works, 247 Park Ave.,
New York City.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Ingersoll-Rand Co.,
11 Broadway, New York City.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.
New York Shipbuilding Co.,
Camden, N. J.
Sturtevant, B. F., Co., Inc.,
Hyde Park, Boston, Mass.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.
Todd Shipyards Corp.,
25 Broadway, New York City
Toledo Shipbuilding Co., Toledo, O.
United Dry Docks, Inc.,
11 Broadway, New York City.

ENGINES (Oil)
Busch-Sulzer Bros.-Diesel Engine Co., 2nd and Utah Sts.,
St. Louis, Mo.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Electric Boat Co.-New London Ship & Engine Works, 247 Park Ave.,
New York City.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Ingersoll-Rand Co.,
11Broadway, New York City.
Standard Motor Construction Co.,
172 Whiton St.,
Jersey City, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.

ENGINES (Steam, Steering)
Dake Engine Co.,
Grand Haven, Mich.

EUROPEAN STEAMSHIP LINES (Passenger and Freight)
Hamburg-American Line
39 Broadway, New York City.

EVAPORATORS
Griscom-Russell Co.,
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General Electric Co.,
Schenectady, N. Y.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

FEED WATER HEATERS—See HEATERS AND PURIFIERS (Feed Water)

FEED WATER REGULATORS
Babcock & Wilcox Co.,
85 Liberty St., New York City.

FIRE BRICK
Babcock & Wilcox Co., The,
85 Liberty St., New York City.

FLOODLIGHTS (Acetylene)
Oxweld Acetylene Co., The,
30 E. 42nd St., New York City.

FLOORING
Selby, Battersby & Co.,
33rd & Arch Sts., Philadelphia.

FLOOR PLATES
Carnegie Steel Co.,
Carnegie Bldg., Pittsburgh, Pa.

FORGINGS
Erie Forge Co.,
15th & Cascade Sts., Erie, Pa.

FOUNDERS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
New York Shipbuilding Co.,
Camden, N. J.

FREIGHT SERVICE
Hamburg-American Line,
39 Broadway, New York City.

FUEL OIL
Standard Oil Co. of New Jersey,
26 Broadway, New York City.
Vacuum Oil Co.,
61 Broadway, New York City.

FURNITURE
Marble & Shattuck Chair Co.,
10200 Foster Ave., Cleveland, O.

FURNITURE (Metal)
Simmons Co., The, 666 Lake Shore Drive, Chicago, Ill.

GALLEY RANGES
Stamford Foundry Co.,
Stamford, Conn.

GEARS (Marine Equipment)
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

GENERATING SETS
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.

GENERATING SETS (Direct Connected)
General Electric Co.,
Schenectady, N. Y.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

GENERATORS
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

GRAPHITE
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GRAPHITE GREASES
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GRAPHITE PAINT
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GRAPHITE PIPE JOINT COMPOUNDS
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GREASE
Vacuum Oil Co.,
61 Broadway, New York City.

GREASE (Launching)
Vacuum Oil Co.,
61 Broadway, New York City

GYPSEYS
American Engineering Co.,
Cumberland & Arimingo Sts.,
Philadelphia, Pa.

GYRO-PILOT (Automatic Steering)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

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Mullholland Hatch-Fastener Co.,
Marion Bldg., Cleveland, O.

HAWSERS (Manila)
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co.,
46 South St., New York City.

HEATERS AND PURIFIERS (Feed Water)
Davis Engineering Co.,
90 West St., New York City.
Griscom-Russell Co.,
285 Madison Ave., New York City.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

HEATING EQUIPMENT
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

HEATING STOVES
Stamford Foundry Co.,
Stamford, Conn.

HOISTING ENGINES
Hyde Windlass Co., Bath, Me.

HOISTS (Air)
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Ingersoll-Rand Co.,
11 Broadway, New York City

INDICATORS (Direction & Revolution)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

INDICATORS (Helm Angle)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

INDICATORS (Speed)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

ICE MACHINES—See REFRIGERATING MACHINERY

INSURANCE (Marine)
Boland & Cornelius.
Marine Trust Bldg., Buffalo, N. Y.

LAMPS (Mazda and Arc)
General Electric Co.,
Schenectady, N. Y.

LIFEBOATS
Lane, C. M., Lifeboat Co., Inc.,
856 Humboldt St., Brooklyn, N. Y.
Welin Davit & Boat Corp.,
3-5 Vernon Ave.,
Long Island City, N. Y.

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856 Humboldt St., Brooklyn, N. Y.

LIGHTING EQUIPMENT
Westinghouse Electric & Mfg. Co.
S. Philadelphia, Pa.

LUBRICATING OIL
Standard Oil Co., of New Jersey,
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Vacuum Oil Co.,
61 Broadway, New York City.

MACHINERY (Marine)
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Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Cooper-Bessemer Corp., The,
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Great Lakes Engineering Works.
River Rouge, Mich.
Manitowoc Ship Building Corp.,
Manitowoc. Wis.
Maryland Dry Dock Co.,
Baltimore Md.
Toledo Shipbuilding Co., Toledo, O.

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Submarine Signal Co.,
160 State St., Boston, Mass.

MACHINISTS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
Busch-Sulzer Bros.-Diesel Engine Co., 2nd & Utah Sts.,
St. Louis, Mo.
New York Shipbuilding Co.,
Camden, N. J.

MAGNETS (Lifting)
Cutler-Hammer, Inc.,
1265 St. Paul Avenue,
Milwaukee, Wis.

MANILA OAKUM—See OAKUM (Marine, Rope, Packings, Plumbers)

MARINE RAILWAY BUILDERS
Crandall Engineering Co.,
Cambridge, Mass.

MATERIAL HANDLING EQUIPMENT
Smith, Leathem D., Dock Co.,
Sturgeon Bay, Wis.

MATTRESSES
Simmons Co., The, 666 Lake Shore Drive, Chicago, Ill.

METERS (Gas & Air)
Cutler-Hammer, Inc.,
1265 St. Paul Avenue,
Milwaukee, Wis.

MOTOR GENERATOR SETS
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

MOTORS (Electric)
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

NAUTICAL INSTRUMENTS
Ritchie, E. S., & Sons,
Brookline, Mass.
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

NAVIGATING INSTRUMENTS
White, Kelvin & Wilfrid O., Co.,
112 State St.. Boston. Mass.

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Linde Air Products Co., The,
30 E. 42nd St., New York City.

NITROGEN
Linde Air Products Co.,
30 East 42nd St., New York City

OAKUM (Marine, Rope, Packings, Plumbers)
Stratford, George, Oakum Co.,
165 Cornelison Ave.,
Jersey City, N. J.

OIL BURNING EQUIPMENT
Babcock & Wilcox Co.,
85 Liberty St., New York City.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.

OIL FOR ALL PURPOSES (Marine)
Vacuum Oil Co., 61 Broadway,
New York City.

OXY-ACETYLENE APPARATUS
Oxweld Acetylene Co., The,
30 E. 42nd St., New York City

OXYGEN
Linde Air Products Co.,
30 East 42nd St., New York City.

PASSENGER SERVICE
Hamburg-American Line,
39 Broadway, New York City.

PLATES (Sheared Steel)
Alan Wood Steel Co.,
Conshohocken, Pa.

PLATES (Steel Floor)
Alan Wood Steel Co.,
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Sheriffs Mfg. Co., Milwaukee, Wis.

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American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
Great Lakes Engineering Works,
River Rouge, Mich.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.
Sheriffs Mfg. Co., Milwaukee, Wis.
Toledo Shipbuilding Co., Toledo, O.
Trout, H. G. Co., 220 Ohio St.,
Buffalo, N. Y.

PROPELLERS
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Hyde Windlass Co., Bath, Me.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.

PULVERIZED COAL BURNERS
Todd Shipyards Corp.,
25 Broadway, New York City.

PUMPS
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DIESEL FUEL OIL

Recommended by the leading Diesel manufacturers, "Standard" Diesel Fuel Oil enjoys world wide distribution and world wide use. Facilities for bunkering with this highly refined and clean power fuel are found in every port—made available by the vast organization of the Standard Oil Company of New Jersey. Use these facilities and receive this better Diesel Fuel Oil.

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Ingleside
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Magpetco
Sabine
Galveston
Port Arthur

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San Francisco
Richmond
San Pedro
San Diego
Astoria
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Tacoma
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North Vancouver
Prince Rupert
Montreal
Ioco, B. C.

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Manzanillo
Guaymas
Topolobampo
Yavaros

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Balboa

West Indies
St. Thomas
Trinidad
Curacao
Kingston

South America
Campana
Buenos Aires
Talara

Azores
Ponta Delgada

Cape Verde Islands
Cape Vincent

United Kingdom
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Norway
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Finland
Helsingfors

Denmark
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Sweden
Stockholm
Gothenberg
Helsinborg
Malmo

Germany
Hamburg
Nordenham
Bremerhaven

Holland
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Rotterdam

Belgium
Antwerp

Italy
Genoa
Venice
Leghorn
Savona
Monopoli
Messina

Africa
Bizerta
Algiers

Turkey
Constantinople

Suez Canal
Port Said

Straits Settlement
Singapore

Greece
Piraeus

Roumania
Constantza

China
Hong Kong
Shanghai
Hankow
Ichang
Dairen

Japan
Nagasaki
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Kobe
Osaka
Tsurmi

Sumatra
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Ingersoll-Rand Co., 11 Broadway, New York City.

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PUMPS (Bilge)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

PUMPS (Boiler Feed)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Fairbanks. Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

PUMPS (Direct Acting)
Dean Brothers Co.. 323 W. 10th St., Indianapolis, Ind.

PUMPS (Power)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

PUMPS (Steam)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

PUMPS (Vacuum)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.

PURIFICATION SYSTEMS—See WATER PURIFICATION SYSTEMS

RADIO COMPASS AND DIRECTION FINDER
Radiomarine Corp. of America, 66 Broad St., New York City.

RADIO EQUIPMENT
Radiomarine Corp. of America, 66 Broad St., New York City.

RAFTS
Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn, N. Y.

RAILWAY DRY DOCKS
Crandall Engineering Co., Cambridge, Mass.

RANGES
Stamford Foundry Co., Stamford, Conn.

REFRIGERATING MACHINERY
Brunswick-Kroeschell Co., New Brunswick, N. J.
Ingersoll-Rand Co., 11 Broadway, New York City

REPAIRS
Maryland Dry Dock Co., Baltimore. Md.

REPAIRS (Electric)
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

REPAIRS (Marine)
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Bath Iron Works Corp., Bath, Me.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Canada Steamship Lines, P. O. 2435, Montreal, Can.
Chicago Shipbuilding Co., So. Chicago. Ill.
Collingwood Shipyards, Inc., Collingwood, Ont., Canada.
Great Lakes Engineering Works, River Rouge, Mich.
Manitowoc Ship Building Corp., Manitowoc, Wis.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
New York Shipbuilding Co., Camden, N. J.
Sun Shipbuilding & Dry Dock Co., Chester, Pa.
Todd Shipyards Corp., 25 Broadway, New York City.
Toledo Shipbuilding Co., Toledo, O.
United Dry Docks, Inc., 11 Broadway, New York City

REPAIRS (Marine Engine)
Collingwood Shipyards, Inc., Collingwood, Ont., Canada.
Electric Boat Co.-New London Ship & Engine Works, 247 Park Ave., New York City.

REPAIRS (Turbine)
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

REVOLUTION COUNTERS
Cummings Machine Works, 255 Atlantic Ave., Boston, Mass.
Sperry Gyroscope Co., Manhattan Bridge Plaza, Brooklyn, N. Y.

ROPE (Manila, Net, Sisal, and Other Hard Fiber Cordage)
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co., 46 South St., New York City.

ROPE (Transmission)
Columbian Rope Co., Auburn, N. Y.

ROPE OAKUM
Stratford, George, Oakum Co., Jersey City, N. J.

RUBBER TILE
Selby, Battersby & Co., 33rd & Arch Sts., Philadelphia.

RUST PREVENTATIVE (Oil)
Vacuum Oil Co., 61 Broadway, New York City.

SAFETY VALVES (Marine)
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

SCHOONERS (Auxiliary)
American Shipbuilding Co., Foot of W. 54th St.. Cleveland.
Toledo Shipbuilding Co., Toledo, O.

SEARCHLIGHTS (High Intensity)
Sperry Gyroscope Co., The, Brooklyn, N. Y.

SEARCHLIGHTS (Incandescent and Arc)
General Electric Co., Schenectady, N. Y.
Sperry Gyroscope Co., The, Brooklyn, N. Y.

SELF UNLOADING EQUIPMENT
Smith, Leathem D., Dock Co., Sturgeon Bay, Wis.

SEPARATORS (Oil)
Babcock & Wilcox Co., 85 Liberty St., New York City.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem. Pa.

SHEETS (Blue Annealed)
Alan Wood Steel Co., Conshohocken, Pa.

SHIPBUILDERS
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Bath Iron Works Corp., Bath, Me.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Canada Steamship Lines, P. O. Box 2430, Montreal, Can.
Collingwood Shipyards, Inc., Collingwood, Ont., Canada.
Great Lakes Engineering Works, River Rouge, Mich.
Manitowoc Ship Building Corp., Manitowoc, Wis.
Maryland Dry Dock Co., Baltimore, Md.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
New York Shipbuilding Co., Camden, N. J.
Smith, Leathem D., Dock Co., Sturgeon Bay, Wis.
Sun Shipbuilding & Dry Dock Co., Chester, Pa.
Todd Shipyards Corp., 25 Broadway, New York City.
Toledo Shipbuilding Co., Toledo, O.
United Dry Docks, Inc., 11 Broadway, New York City.

SHIPBUILDING SYSTEMS
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SHIP STABILIZERS
Sperry Gyroscope Co., The, Brooklyn, N. Y.

SIGNALS (Submarine)
Submarine Signal Co., 160 State St., Boston, Mass.

SOUNDING MACHINES
Submarine Signal Co., 160 State St., Boston, Mass.

SPRINGS (Box, Bed)
Simmons Co., The, 666 Lake Shore Drive, Chicago, Ill.

SPUN OAKUM
Stratford, George, Oakum Co., Jersey City, N. J.

STEAMSHIP LINES (Passenger and Freight)
Hamburg-American Lines, 39 Broadway, New York City.

STEAM GAGES
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

STEAM TRAPS
Davis Engineering Co., 90 West St., New York City.

STEEL BARGES—See BARGES (Steel)

STEEL TANKS
Brunswick-Kroeschell Co., New Brunswick, N. J.

STEERING ENGINES
Hyde Windlass Co., Bath, Me.

STEERING GEARS
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Hyde Windlass Co., Bath, Me.

STOKERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

STORAGE BATTERIES—See BATTERIES

STOVES
Stamford Foundry Co., Stamford, Conn.

SUPERHEATERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

SWITCHBOARDS
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

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Hyde Windlass Co., Bath, Me.

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Cummings Machine Works, 255 Atlantic Ave., Boston, Mass.

TOWING
Moran Towing & Transportation Co. 17 Battery Place, New York City.

TOWING LINES
Columbian Rope Co., Auburn, N. Y.
Whitlock Cordage Co., 46 South St., New York City.

TRACTORS
Clark Tructractor Co., Battle Creek, Mich.
Elwell-Parker Electric Co., The, 4205 St. Clair Ave.. Cleveland, O.

TRANSMISSION (Rope)—See ROPE (Transmission)

TREADS (Steel Stair & Ladder)
Alan Wood Steel Co., Conshohocken, Pa.

TRUCKS
Clark Tructractor Co., Battle Creek, Mich.
Elwell-Parker Electric Co., The, 4205 St. Clair Ave., Cleveland, O.

TRUCKS (Dump)
Clark Tructractor Co., Battle Creek, Mich.

TURBINES (Electric)
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TURBINES (Marine)
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TURBINES (Steam)
DeLaval Steam Turbine Co., Trenton, N. J.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
Sturtevant, B. F., Co., Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

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Samson Cordage Works, Boston.
Whitlock Cordage Co., 46 South St., New York City.

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WATER PURIFICATION SYSTEMS
Griscom-Russell Co., 285 Madison Ave., New York City.

WELDERS (Electric Arc)
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

WELDING & CUTTING APPARATUS (Oxy, Acetylene, Oxy-Gas)
Oxweld Acetylene Co., The, 30 E. 42nd St., New York City

WELDING GAS
Prestolite Co., The, Inc., 30 E. 42nd St., New York City

WELDING SUPPLIES
Oxweld Acetylene Co., The, 30 E. 42nd St., New York City

WHISTLES
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

WINCHES
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Dake Engine Co., Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WINDLASSES
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Dake Engine Co., Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WIRELESS MESSAGE SERVICE
Radiomarine Corp. of America, 66 Broad St., New York City.

WIRELESS SETS AND APPARATUS
Radiomarine Corp. of America, 66 Broad St., New York City.

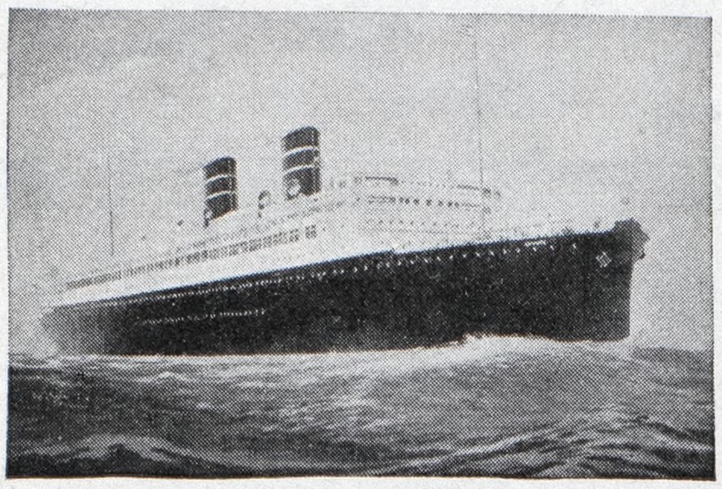
WORKBOATS
Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn.

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"The Standard for All Marine Installations"

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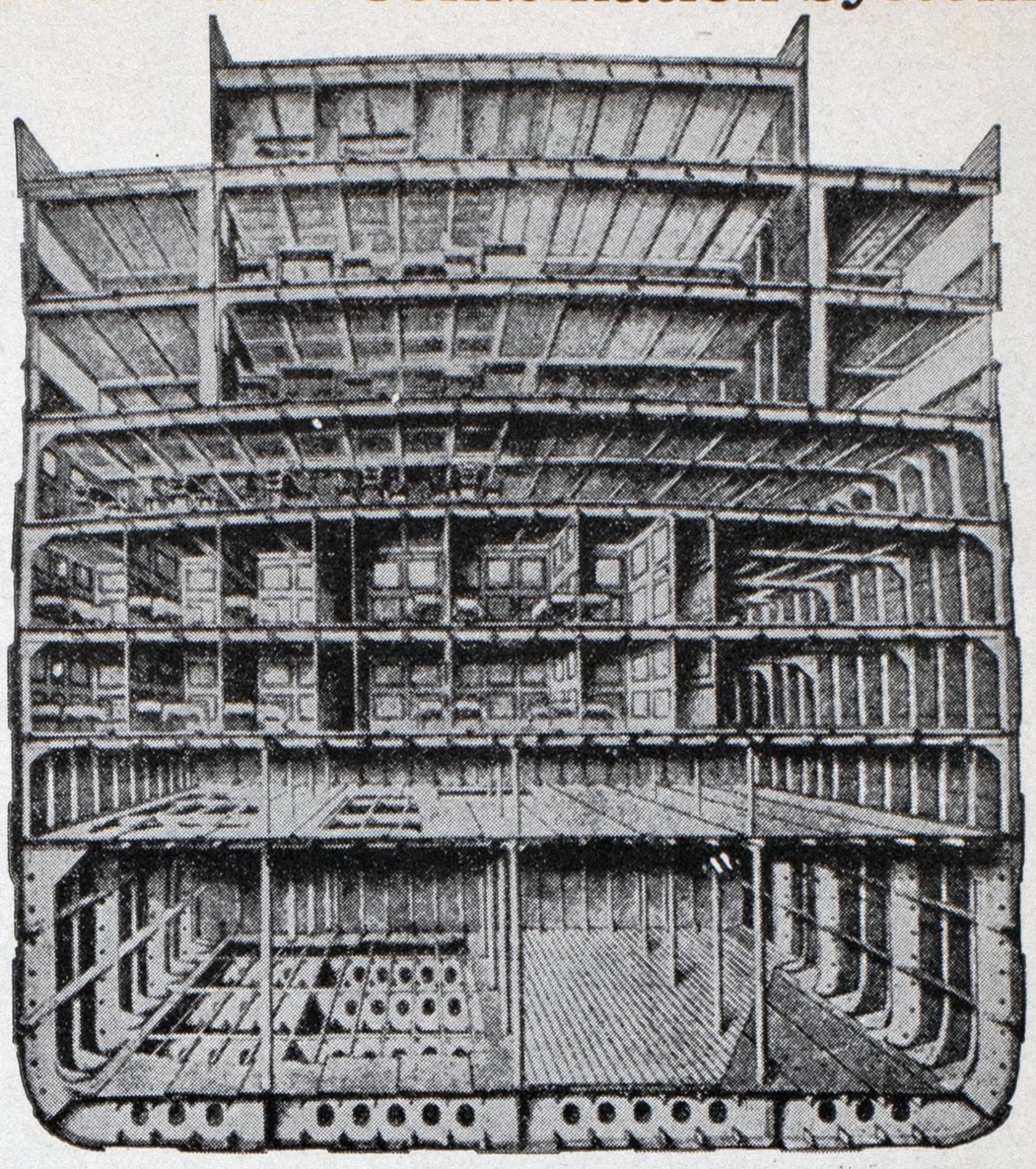
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for the ORIENTE and MORRO CASTLE

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ENGINEERS and MANUFACTURERS
REFRIGERATING and ICE MAKING MACHINERY
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Sectional View of Interior of Passenger Liner designed on the Isherwood Combination System
(In a vessel of this type, deep transverses are recommended for hold construction, but are not essential.)
Adaptable to any type but particularly advantageous for passenger liners.

Shipowners are advised to specify that plans and structural arrangements should be approved by

SIR JOSEPH W. ISHERWOOD & CO., Ltd.
17 BATTERY PLACE, NEW YORK
and 4, LLOYD'S AVENUE, LONDON, E. C. 3

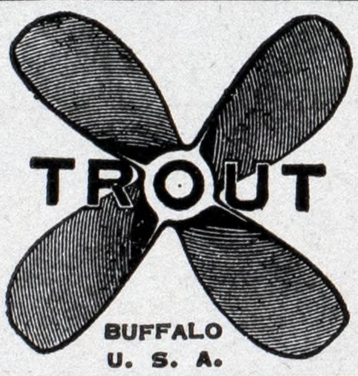
2



Propeller Wheels and Blades

to fit any hub.

Sheriffs Manufacturing Co.
Established 1854
Milwaukee, Wis.



Star Brass Mfg. Co.

53 Oliver Street -::- Boston, Mass.
MANUFACTURERS OF
Accurate "Non-corrosive" Pressure and Recording Gauges, Revolution Counters, Marine Clocks.
Dead Weight Gage Testers.
Marine, Safety and Relief Valves for all pressures.
Marine Whistles and Sirens.
Extra Heavy Renewable Globe, Angle and Check Valves.
Star Outside Spring Steam Engine Indicators.
HIGH GRADE THROUGHOUT
SPECIFY AND ORDER THE BEST.
Branches: CHICAGO PITTSBURGH NEW YORK

Kelvin & Wilfrid O. White Co.

112 State Street, Boston
Ship Compasses
Navigational Equipment
Contracts a Specialty
New York and Montreal

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If you have a passenger ship, freighter, tanker, tug or any other floating property or marine equipment for sale advertise it in Marine Review.

The rate is $3.00 for a minimum advertisement of 30 words. Additional words, 10c each.

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On board the new Ward Liner, "Morro Castle" . . . on board the new Grace Liner, "Santa Clara" . . . on board the new American-South African Liner, "City of New York" . . . on board the new Coast Guard Cutters, "Itaska", "Sebago", "Saranac".

In fact, on board most all of the outstanding new ships—and the older ones—you will find Paracoil equipment holding responsible positions.

Paracoil Feed Water Heaters, Evaporators, Distillers, Lubricating Oil Coolers, etc., etc., have been standard marine equipment for many years.

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Itaska
Sebago
Saranac
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Six words must be added for box address.

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HARBOR TUG
FOR CHARTER

Steel tug — 1000 H.P. 210 pounds Steam pressure 86 ft. long, 144 ton gross, surface condenser, towing machine, steam windlass, etc. Just completely reconditioned and ready for work.

Address Box 417
MARINE REVIEW, Cleveland, O.

FOR SALE OR CHARTER, 42" x 12'6" x 4 all steel Cabin boat; can be used for supply boat or light towing. Two 35 H.P. Fairbanks-Morse Diesel engines one man control. Frank Becker, 5032 Vinewood, Detroit, Mich.

For Sale

FOR SALE — STEEL FREIGHTER M. L. Edwards. Built 1922. 64'10" x 22' x 6'6" carries 120 tons, high pressure engine upright. Boiler, Boom and Hoist. Capt. Edwards, 1507 Barry Ave., Chicago, Ill.

For Sale

NEW DIESEL ENGINES
FOR SALE

5-6 cylinder Busch Sulzer 450/500 BHP, 410 RPM, non reversible. Ideal for Diesel Electric Drive. Can be made reversible. Price $3500.00 each.

A. W. LAWSON
WHITE BUILDING, SEATTLE, WASH.

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1 Steel
3 Wood
Steam Fishing
Tugs
Fully Equipped
Low Prices

The Case Fish Co.
Cleveland, Ohio

DOUBLE DECK HOUSE BOAT, FLOATING at Alicia, Pa. Hull: frame 18'8" wide by 4' deep by 80'2" long; Fir Wood. 10 timber heads and 1 capstan. Drop Sliding, partitions and ceiling, T & G. Wired for electric lights. Composition roof. Details given on application. Monessen Coal & Coke Co., P. O. Box 72, Pittsburgh, Pa.

For Sale



FOR SALE OR CHARTER, 60 X 16 X 4 FT. 4 draft, Standard Engine 6 x 8, 6 cyl., Inspected and equipt to carry 125 people. Tows and handles well and is a first class boat, wheel house control, lavatory, running water, Delco Light plant, etc., and is ready to go right now. McLOUTH SHIPYARD, MARINE CITY, MICH.

FOR SALE: MARINE ENGINES AND boilers of all sizes; light draft wooden and steel tug boats for sale or charter; derrick boats, deck scows and lighters for sale or charter. Cowles Towing Co., Buffalo. N. Y.

DOUBLE DECK HOUSE BOAT FLOATING at Alicia, Pa. Hull: frame 26' wide, 4'4" deep, 100' long; Fir wood, Partitions and ceilings T & G. Wired for electric lights. Composition roof. Good condition. Details on application. Monessen Coal & Coke Co., P. O. Box 72, Pittsburgh, Pa.

FOR SALE—SCHOONER LUCIA SIMPSON 215 tons net. 127 x 28 x 8.7 ft. 12 H.P. boiler, winch and bilge pump. At Sturgeon Bay, Wis. Write Northern Marine Corporation, 835—72nd Ave., Milwaukee, Wis.

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The classified section of MARINE REVIEW is for your convenience —its value is proving very worthwhile to everyone who uses it to buy and sell.

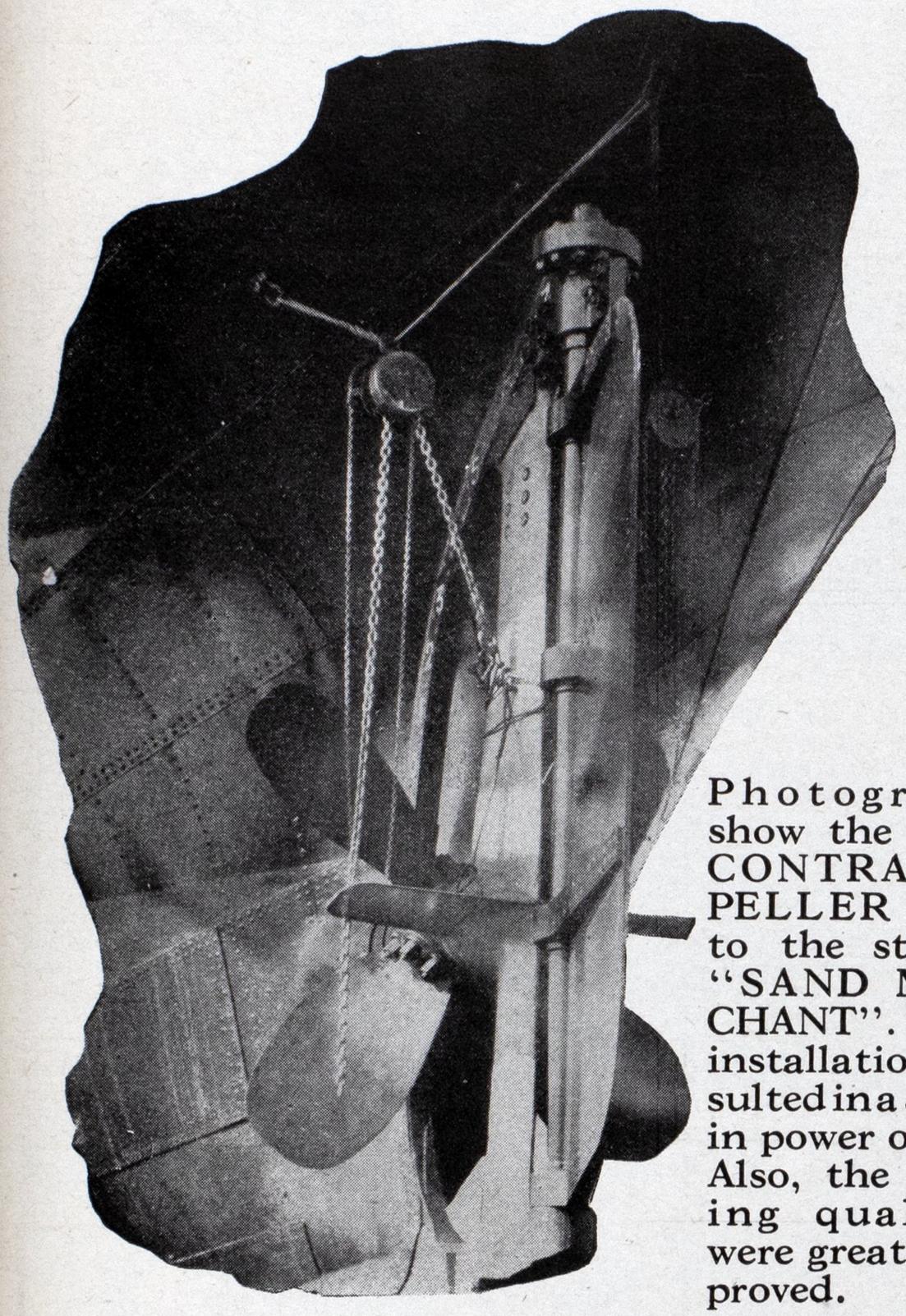
If you want to buy or sell ships or marine equipment—need a man for your organization—make it known to the entire marine industry through the use of classified advertising in MARINE REVIEW.

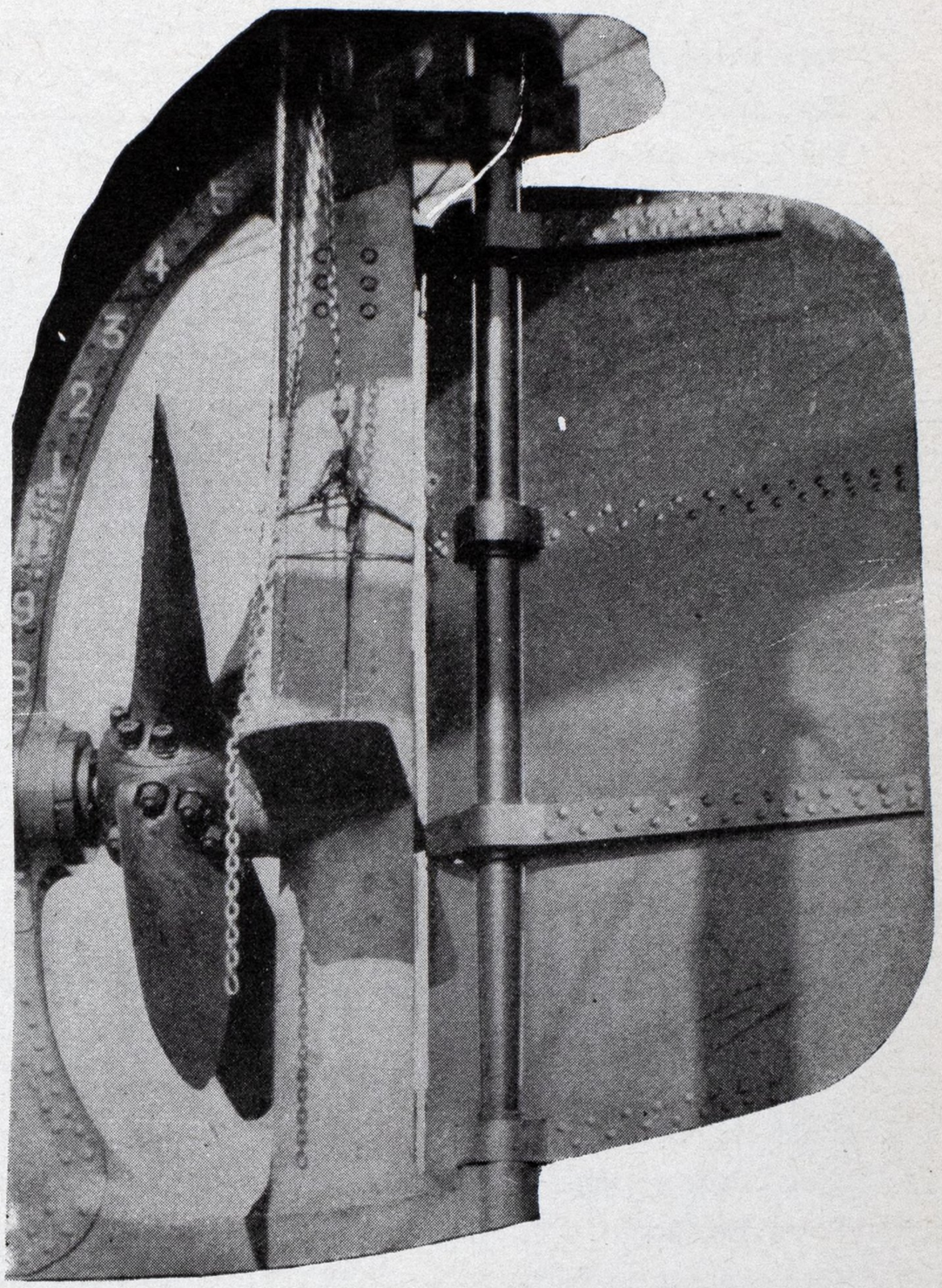
Mail copy for your advertisement in the September issue today, so it reaches us before August 20.

Collingwood Shipyards Limited

Collingwood, Ontario

Sole Licencees for Canada— for Star Contrapropellers and Rudders





Photographs show the STAR CONTRAPROPELLER fitted to the steamer "SAND MERCHANT". This installation resulted in a saving in power of 12%. Also, the steering qualities were greatly improved.

STAR CONTRAPROPELLERS have been fitted to 425 vessels representing 2,577,181 tons with an aggregate of 1,035,493 I. H. P.

The main advantages are:

Saving in power of from 10% to 15% for the same speed.
Increase in speed of from 5% to 10% for the same power.
Improved steering, which is important in handling ships in canals and narrow waterways.

Reduction in vibrations.
The Contrapropeller is applicable to all types of vessels.

PLANS AND ESTIMATES WILL BE FURNISHED ON APPLICATION

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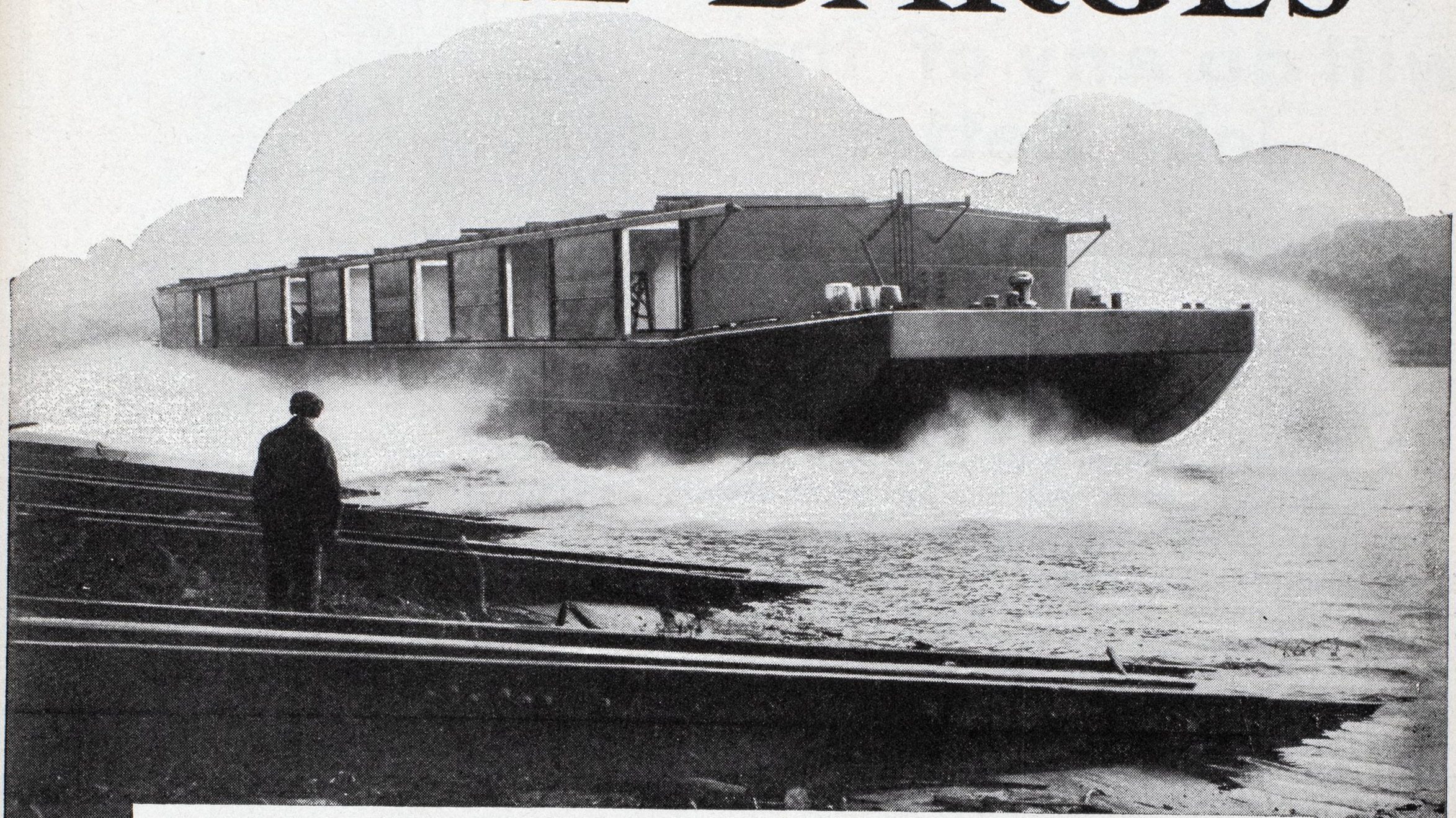
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has given special attention to DESIGNING and BUILDING

STEEL BARGES



THIS is the twenty-seventh consecutive year we have maintained the steel barge building yard at our structural steel fabricating plant at Ambridge, Pa. During this period of over a quarter of a century 1500 HULLS have been launched from the ways of this yard. Some of these were of unusual size or for special purposes, and include standard barges, fuel lighters, a floating hangar, floating dry docks, dump scows, derrick boats, etc.

The services of our engineering forces are available for the preparation of specifications and the development of size and type of steel barges to meet the standard or special requirements of users or prospective users of inland waterways.

Inquiries are solicited and will be given prompt attention.

AMERICAN BRIDGE COMPANY

Subsidiary of United States Steel Corporation

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Barge Department, **Frick Building, Pittsburgh, Pa.**

Pacific Coast Distributor:
Columbia Steel Company
San Francisco, Calif. Los Angeles, Calif. Portland, Ore.
Seattle, Wash. Honolulu, T. H.

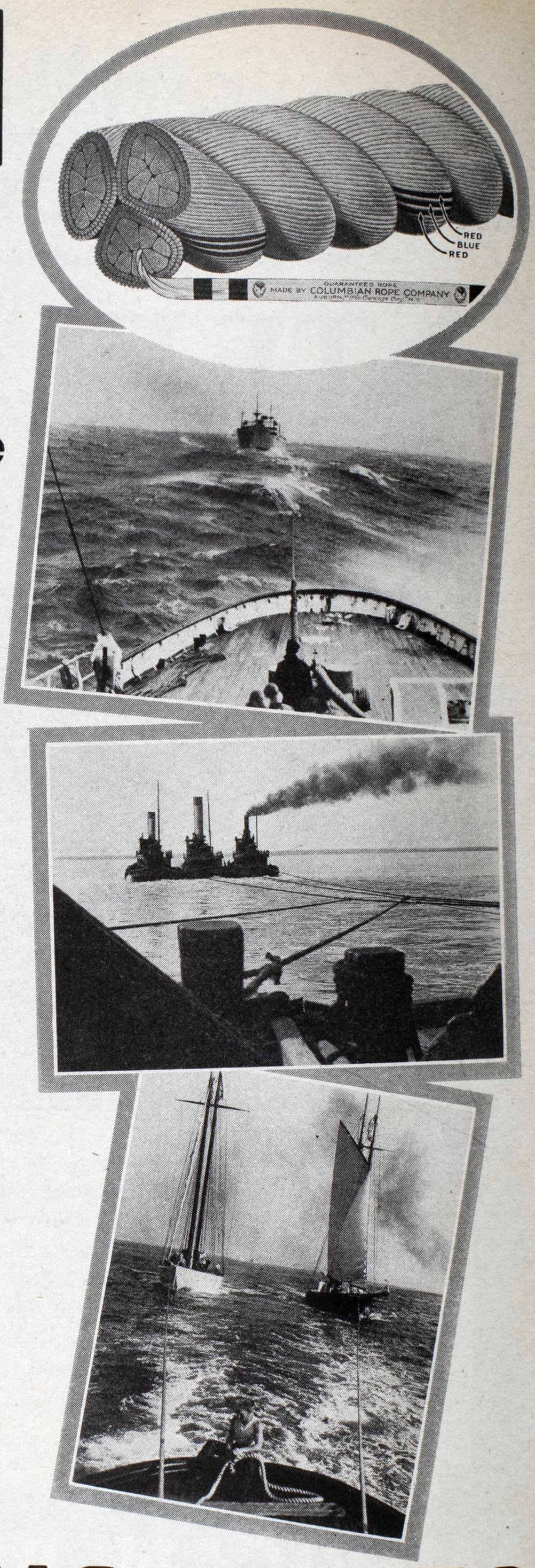
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Export Distributor:
United States Steel Products Company
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New York, N. Y.

COLUMBIAN TOW-RO

PATENTED

will do any of these jobs Better



It is the towing line of individuality—the only line of its kind and its patented new construction gives it a superior performance.

Just as Columbian engineers have developed Columbian *Tape-Marked* Rope to the point where it is an accepted leader, so have they perfected a line for towing which is also a leader—Columbian Tow-Ro. Its construction is a step forward in towing line manufacture for it offers the user the only perfectly balanced tow line on the market.

The heart of Tow-Ro is composed of large yarns, pretwisted slightly. These have been designed to absorb the shock and stand the pull of the tow and they do it to perfection. Then an extra-tough outside jacket of regular size yarns in a double thickness is used to protect the heart and resist outside abrasive wear.

Tow-Ro is waterproofed as only Columbian waterproofs rope. It has flexibility without distortion, it can be easily spliced and is positively guaranteed by the famous *Tape-Marker*. It is also readily identified by the red, white, blue, white and red, surface markers.

No captain likes to pick up a tow at sea, especially during a blow. However, it is necessary at times and when his towing line is Columbian Tow-Ro, he may rest assured that if it is possible to hold a tow, Columbian Tow-Ro will do it.

To get more Towing miles per Line, use Columbian Tow-Ro Pure Manila Rope.

COLUMBIAN ROPE COMPANY
332-90 Genesee Street
Auburn, N. Y. *"The Cordage City"*
Branches— New York Chicago Boston New Orleans Philadelphia

MORE TOWING MILES PER LINE

Quality at NEWPORT NEWS

NO job is good enough in the yards at NEWPORT NEWS as long as there is possibility of improvement.

Initiative and pride in workmanship are encouraged to the point where everyone contributing to the design and construction of ships BUILT AT NEWPORT NEWS follows with keen interest their performance for many years after they are completed.

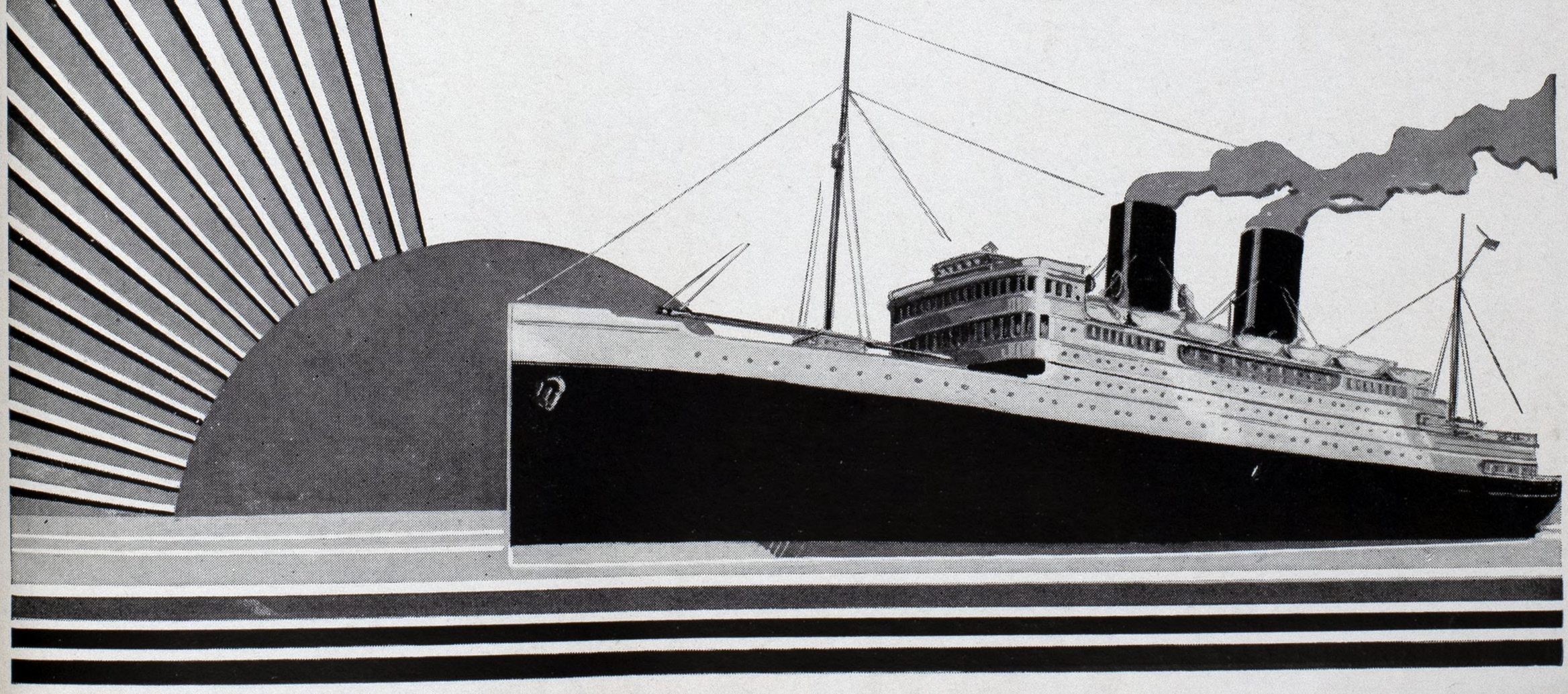
NEWPORT NEWS has always built good ships.

It is the sincere endeavor of every member of a highly efficient and skilled organization to set the highest standards of design and workmanship—to give the client the best that can be produced with the aid of proper shipbuilding facilities and scientific scheduling methods—in short, to produce better ships.

"SHIPS OF CHARACTER"

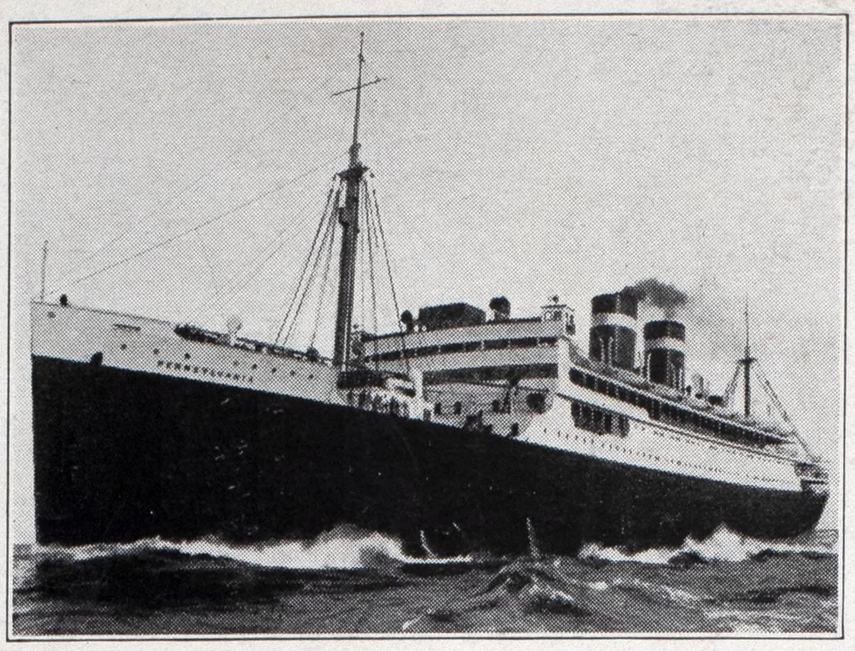
Newport News Shipbuilding and Dry Dock Company

Newport News, Va. 233 Broadway, New York City



S. S. Pennsylvania of the Panama Pacific Line. Sturtevant Equipped.

Photo—Ed Levick, N. Y.



Sturtevant TRADE MARK

Sturtevant Equipment — Dependable and Efficient

Dependable and efficient — that is the reputation of Sturtevant Marine Equipment . . . a reputation gained over a period of many years successful operation on all types of ships. And many times, operating under the most adverse conditions.

These outstanding performances are due to the high efficiency, economical operation, long service and extraordinary freedom from trouble that is characteristic of Sturtevant apparatus.

Sturtevant Marine Equipment is adapted to all types of ships, from small yachts to great ocean liners, as well as all classes of naval ships. Our Marine Department will gladly cooperate with you in determining the type of equipment to meet your requirements.

B. F. STURTEVANT COMPANY, HYDE PARK, BOSTON, MASS.

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Heating and Ventilating Equipment—

Mechanical Draft Equipment—Turbines—Motors—Blowers—

Ventilating Sets—Heaters—Generator Sets—Exhausters

Gasoline and Steam Engines

If You Want The Best Specify

Hyde

S. S. "A. F. HARVEY" owned by Pittsburgh Steamship Co. and built by Great Lakes Engineering Works.

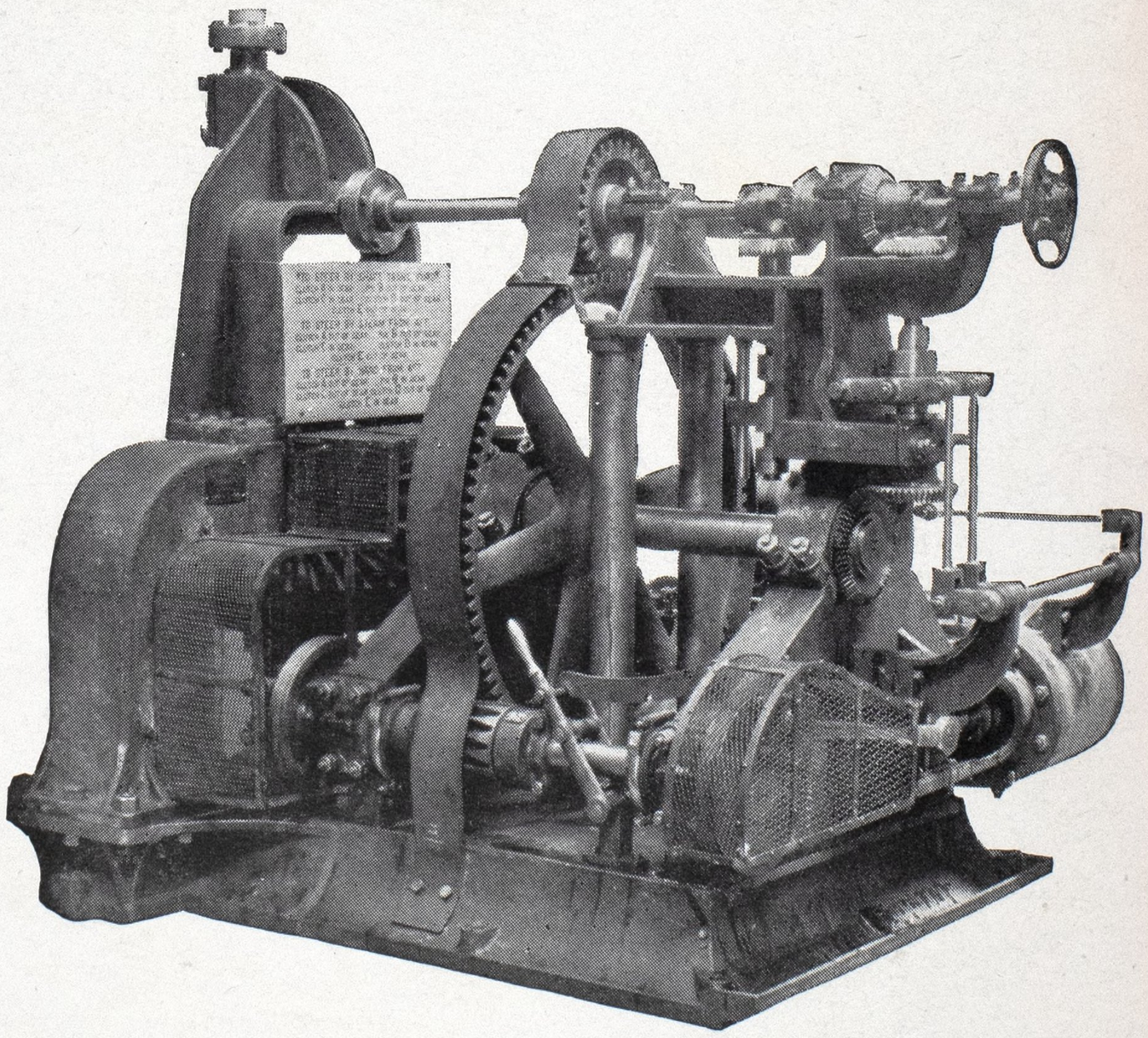
S. S. "B. F. AFFLECK" owned by Pittsburgh Steamship Co. and built by Toledo Shipbuilding Co.

S. S. "S. T. Crapo" owned by Huron Transportation Co. and built by Great Lakes Engineering Works.

These three fine new boats are all equipped with

Hyde

Quadrant Type Steering Gear
Spur Gear Windlass
Mooring Winches
Hatch Winches



HYDE Quadrant Type Steering Gear

Hyde Windlass Company

Bath, Maine